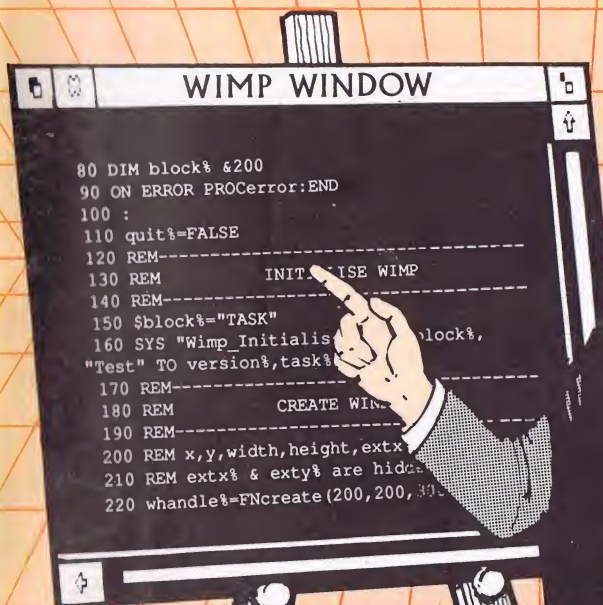


Volume 2
Issue 9

September
1989

Price £1.20

RISC USER



Mastering the Wimp

THE MAGAZINE AND SUPPORT GROUP
EXCLUSIVELY FOR USERS OF THE ARCHIMEDES

RISC USER

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RISC User is published by BEEBUG Ltd.

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The Archimedes Magazine and Support Group.

EDITORIAL

RISC USER SURVEY

We were more than pleased at the response to our Reader Survey included with the April issue of RISC User (Volume 2 Issue 7). Not only did over 500 members take the time and trouble to reply, but many included additional and constructive comments as part of their response, and several readers even wrote separate letters with further comments and suggestions.

We have now completed a preliminary analysis of the responses, and are already using the information obtained in planning this and future issues of RISC User. For example, a majority of readers were positively in favour of reducing the number of long listings in the magazine, which supports the moves in this direction which we had already begun to make.

Another interesting snippet from the statistics is that over 70% of readers claim to have purchased some item as a result of an advert in RISC User, indicating both the dedication to the Archimedes of our readership, and the value of the advertising to our readers.

We should have completed our analysis in time for the October issue.

RISC OS IS THE ARCHIMEDES

Now that the RISC OS upgrade is available from stock (and at the time of writing still at the special low price of £33.35 inc. VAT (plus postage - category D, see Retail Catalogue) we will in future concentrate solely on RISC OS when it comes to writing, editing and checking programs for RISC User. RISC OS is THE Archimedes operating system, and turns the machine into the sophisticated but easy-to-use system we all hoped it would be.

NEW BEEBUG PRODUCTS FOR THE ARC

You may already be aware that BEEBUG has been developing a number of new products for the Archimedes. First to be available are Hard Disc Utilities providing sophisticated backup, archiving (file compression) and file finder for approximately £35 to members, and Scavenger, a scanner system for the Archimedes which will offer a resolution of 400 dots per inch at prices from just under £200. Full details of both products are in the Retail Catalogue.

A3000 ON SPECIAL OFFER TO TEACHERS

Acorn has announced a joint scheme with selected Acorn dealers (including BEEBUG) to offer the A3000 at a reduced price to teachers. Full details are available from BEEBUG.

NewsNewsNews NewsNew

A3000 SUCCESS AT SHOW

The new Acorn A3000 proved a major success at the recent BBC Acorn User Show. It was the first opportunity for members of the public to purchase the new machine, and to cope with the expected demand, Acorn provided a large lorry full of A3000s. In the event, the demand outstripped even Acorn's most optimistic predictions, and after the three days of the show only a handful of machines remained. This success was probably partly due to the special arrangement with Mercantile Credit, by which purchasers could buy the system with 0% finance over 12 months, this being arranged on the spot. As a further incentive, Acorn was giving away a free carrying case and monitor stand with each A3000, and BEEBUG was supplementing this with an additional package of free items worth nearly £100.

ARMADEUS

Armadeus is a new package from Clares, which despite the corny name isn't in fact a music program. Rather, it is a sound sampler system which is designed to work with either Clares' new sound sampler podule, or with a number of existing podules such as those from Armadillo and Wild Vision. *Armadeus* allows sampled images to be edited, and pseudo-stereo and echo added. The sampled waveform can be displayed on screen as a graph, and can be edited to make changes to the sound. It is also possible to connect a keyboard via a MIDI podule to allow playback of the sampled sounds, and to read tunes from Atari format discs. *Armadeus* costs £79.95 (inc. VAT), and includes two discs of sampled sound.

To complement *Armadeus*, Clares have produced a sound sampler podule. This features line and microphone inputs, and has software selectable gain to ensure the correct level is chosen while sampling. Also provided on the podule is a sound output offering superior quality compared to the Archimedes' headphone socket. The Clares' sound sampler costs £149.95 (inc. VAT). More details are available from Clares Micro Supplies, 98 Middlewich Road, Northwich, Cheshire, tel. (0606) 48511.

COLOUR DIGITISING

Wild Vision, a company known for its graphics hardware, has announced a real time colour video digitiser for the Archimedes. Unlike other such products, the Hawk V9, as the new system is called, can capture an image in the space of a single frame. This means that moving images can be taken directly from a video camera without the need for a video recorder with a high quality freeze frame facility. The image is read directly into the Archimedes memory, at a resolution of 256 by 512. The supplied software subsequently allows this to be displayed in any 256-colour mode, and sections of the image can be saved as sprites for incorporating into other packages. The Hawk V9 should be available by the autumn, and will sell for under £500. For more details, contact Wild Vision, 6 Jesmond Road, Newcastle Upon Tyne NE2 4PQ, tel. 091-281 8481.

LET ME TELL YOU A STORY

Presenter-Story is a new Desktop Presentation system from Linguinity. For those who are unfamiliar with the term, Desktop presentation is the name given to the process of producing fancy text and graphics screens to form a display sequence. A typical example would be a rolling demo running in a shop window. The presentation sequence is built up from a number of pre-created frames, and these can consist of either text or graphics. Text can be in any fancy font, and in a number of styles and colours. Graphics can consist of displays such as histograms and barcharts, as well as logos which can be designed using a built-in editor. The display sequence is specified using a script language, and the method of moving from one frame to another is programmable. User input can alter the flow of the sequence, and hard copy of frames can be obtained via the RISC OS printer drivers. *Presenter-Story* costs £229.94 (inc. VAT).

Also new from Linguinity is *Presenter II*, a revised version of the company's existing package. Despite the similar names, this package performs a different function to *Presenter-Story*, and allows imported data to be displayed in various graph formats, including three

dimensional forms. The numeric data can be imported from a number of sources, including standard comma separated value format. *Presenter II* is fully multi-tasking under the RISC OS Desktop, and completed graphs can be printed out using the RISC OS printer drivers. *Presenter II* costs £57.44 (inc. VAT). For more details of both products, contact Lingenuity, Wood Farm, Linstead Magna, Halesworth, Suffolk IP19 0DU, tel. (0986) 85477.

SCSI SYSTEMS

The latest craze in Archimedes hardware appears to be SCSI (Small Computer Systems Interface) hard disc drives. Two companies, Oak Computers and Lingenuity, both launched packages at the BBC Acorn User Show. While SCSI is a general purpose interface for connecting peripherals and storage devices, both companies were using the system to connect high-capacity hard discs to the Archimedes.

The Lingenuity system consists of a half width SCSI interface module which costs £228.85 (inc. VAT), or £573.85 (inc. VAT) with a 45Mbyte internal hard disc drive. Lingenuity also do a version for the A3000, costing £171.35 (inc. VAT) for the internal expansion board, or £516.35 (inc. VAT) with a 20Mbyte external drive. The Oak system uses a similar interface card, but they offer a wider choice of drives, from a 20Mbyte internal unit at £431.25 (inc. VAT) to a 330Mbyte external device for £2760 (inc. VAT). Both systems include an ADFS-like filing system which will control not only hard discs, but also other SCSI devices such as tape streamers.

More details can be obtained from Lingenuity at the address given below, and from Oak Computers, Cross Park House, Low Green, Rawdon, Leeds LS19 6HA, tel. (0532) 502615.

MEWSOFT PRODUCTS

Mewsoft has upgraded its product line to include full Archimedes versions of its products. The three titles, the *Fax*File Manager*, the *Forms Manager* and the *Fancy Labeller* were previously available in versions that worked

on both the model B and the Archimedes. The first of these programs is designed to generate printed pages suitable for incorporating into personal organisers, and includes a 480 entry address book and diary. The other two packages allow forms and labels to be designed to your particular requirements. Mewsoft claim that the new versions make full use of the power of the Archimedes. The packages cost £27.90 (inc. VAT) each, and are available from Mewsoft, 11 Cressy Road, London NW3 2NB, tel. 01-267 2642.

STUDYING 1ST WORD PLUS

Norfolk Educational Press has produced a study guide for the 1st Word Plus word processor, as part of the government's TVEI program. The fourteen page guide is split into thirteen separate exercises, each covering a different feature of 1st Word Plus. The guide is presented in a style which is designed to let relative newcomers to word processing pick up details of all the available features very quickly. The cost of the guide is £15.00, which includes a disc featuring the sample text used throughout the book. For educational users, a considerable discount is available on multiple copies. For more details, contact The TVEI Unit, The County INSET Centre, Witard Road, Norwich, Norfolk NR7 9XD, tel. (0603) 33276.

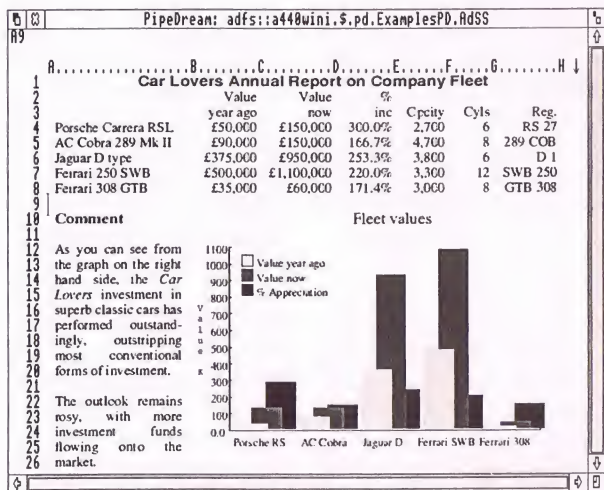
MICRONET TAKEOVER

The Telemap Group, who run the Micronet computer magazine on Prestel has been bought out by British Telecom, who previously owned a 40% stake in the company. Commenting on the takeover, John Tomany, managing director of the Telemap Group, said that it was a logical move. He added that business is as usual, but that the closer integration with British Telecom itself will allow future improvements in the services provided by Micronet.

Meanwhile, the Telemap Group has moved from their London office to new premises at Dialcom House, Brindley Way, Hemel Hempstead, Herts HP3 9RR, tel. (0442) 237788. All Micronet correspondence should be sent to this new address.

RU

PIPEDREAM 3



PipeDream 3 breaks down the barriers between word processor, spreadsheet and database. You can include numerical tables in your letters and reports, add paragraphs to your spreadsheets, and perform calculations within your databases.

Based on PipeDream 2, the best-selling integrated package for the Archimedes, PipeDream 3 has been completely re-written to take full advantage of RISC OS - if you can use RISC OS, you can use PipeDream 3. It is fully multi-tasking and multi-windowing, so you can work on many documents at once and instantly move information between them. And since PipeDream 3 can automatically load and save most popular file formats, including VIEW and First Word Plus, switching to it from other programs has never been easier.

Power, flexibility, speed, ease of use. PipeDream 3. Breaking down the barriers.

For a free brochure, see your Archimedes dealer, or phone us on 0954 211472 or return the coupon.

PipeDream 3 is for all Archimedes computers with RISC OS and 1Mbyte of RAM.

PipeDream 3 costs £147.00 +VAT.

Major features include:

- many documents loaded at once
- intuitive RISC OS user interface
- displaying and printing of pictures within text
- built-in 93,003 word spelling checker
- file compatibility with PC & Z88 PipeDream and BBC View Professional
- background recalculation
- keystroke compatibility with Z88 & PC PipeDream
- Z88 filling system
- automatic loading of VIEW, ViewSheet, Lotus, First Word Plus, Tab and CSV files
- automatic saving of VIEW, Lotus, Acorn DTP format, Tab and CSV files
- multi-field sorting
- use of all available fonts
- 62 spreadsheet functions
- external references for 3-D modelling
- macro file recorder
- slot protection

For a free brochure, complete and return this coupon
PipeDream 3 ☐ View Professional ☐

Name

Address

Post code

Colton Software, Broadway House, 149-151 St. Neots

Road, Hardwick, Cambridge CB3 7QJ, England.

Fax: 0954 211607 Tel: 0954 211472

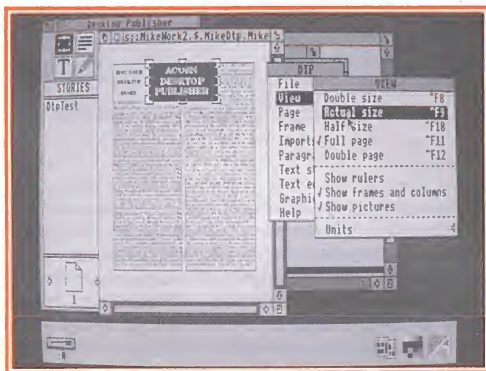
All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingenuity's Presenter 2 and then loading the resulting graph back into PipeDream 3.

Colton Software, Broadway House, 149-151 St. Neots Road, Hardwick, Cambridge, CB3 7QJ, England.

Fax. 0954 211607 Tel. 0954 211472

Reviewed by Mike Williams

In our recent reader survey, desktop publishing (known as DTP) was cited by many readers as an application in which they were interested and intended to buy a suitable package. As you may know, many software houses, including BEEBUG, have been developing DTP packages, but it is Acorn who are first in the field. Is this going to be the definitive DTP package for the Archimedes, or would you do better to wait? I hope to give you some guidance on answering that question in the course of this review. Here at BEEBUG, we have been using DTP (though on an Apple Macintosh) to originate both BEEBUG and RISC User for over two years now.



Test document as described in text

For those who are not really sure what DTP is all about, a brief introduction. DTP is concerned with the design and layout of both text and graphics on the page for printing. It usually gives considerable control over the appearance of text, including choice of font and size, less so with regard to graphics. Most DTP packages include some word processing capability and some rudimentary drawing tools, and there is obviously an overlap here with other applications.

In one respect, it is not surprising that Acorn's DTP package has appeared first. It is not completely new, but a rewrite of Timeworks Desktop Publisher for the Atari ST and PC market, where it has achieved

some success as a low cost DTP package. Desktop Publisher for the Archimedes is produced as an Acorn product, in the same way as 1st Word Plus, by GST.

The packaging is quite lavish, a very smart slip-in box and library case containing three discs, a relatively slim 140 page manual, and the inevitable keystrip. The three discs comprise a programs disc, a work disc, and an examples disc. In reviewing Acorn Desktop Publisher I propose first to describe its main features in order to give some indication of what it can do, and to try and convey something of its flavour. I will then consider some major issues of importance to anyone contemplating purchase, before giving my conclusions.

USING ACORN DTP

Like all good RISC OS software, Acorn DTP is installed as an application on the icon bar. Double clicking on this opens a window which will contain the page you are working on, and a second window which allows the choice of one of four tools: Frame, Text, Paragraph, and Graphics. All functions within Acorn DTP fall into one of these four categories or modes.

All pages have a default *format*, a *master page* and may use one or more *style sheets*. The page format determines the size of paper you are working with (A4 etc), its orientation (portrait or landscape), and whether left- and right-hand pages are to the same format. Note that the page format can only be altered before you start work on a document, otherwise the default (A4 size) is used.

All text and graphics is laid out within frames. The master page allows you to set a standard which will be used by all pages in a particular document, for example number, size and position of columns. You can also establish separate masters for left- and right-hand pages.

Style sheets are used to determine the style of a paragraph, including choice of point size (the way in which character size is measured), font (e.g. Courier, Helvetica etc.), and style (bold, italic, underline etc.). Style

RISC USER DESKTOP DIARY

by Mike Ironmonger

ACORN DESKTOP PUBLISHER

This article, with part two to follow next month, describes a useful diary facility to add to your Desktop, and is fully RISC OS compatible. The program runs from an application directory, and uses all the standard Desktop features. When installed, the diary icon appears on the menu bar.

file for subsequent reloading, though you can create as many separate diary files as you wish. Saving and loading follows RISC OS standards. To load a diary file, double click on its icon, or drag it on to the Diary icon on the menu

bar (once installed). If a file is loaded which has an entry for the current date then a window will automatically be opened showing that entry. Dragging a diary file into the calendar window or an entry window will merge the entries in that file with those already loaded and present, overwriting existing

Part of test document output on a laser printer

sheets also control justification, tab settings, hyphenation, spacing algorithms and leading (pronounced 'leading' - the spacing between lines). Four style sheets are provided as standard; you can modify these as well as designing your own. The style sheet called *body text* is used as the default. However, choice of font, point size and style can also be controlled independently of style sheets.

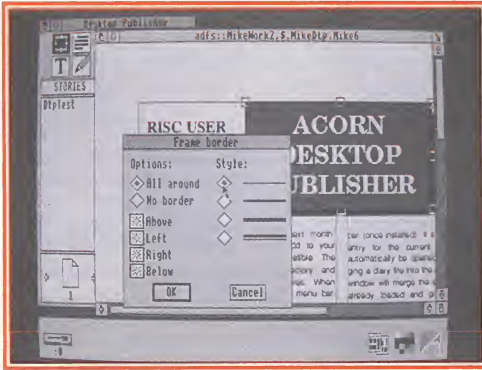
I created a document to test the package after working through the tutorial sections of the manual. The first step was to set up the two column format that I required on the master page, and I decided to position a box centrally at the top containing a title 'white-out' on a dark grey background, and using a so-called drop-shadow frame. The frame tool allows you to create boxes, and to give a box one of four styles of border (three sizes of single line, one double line). To create a drop-shadow box, I had to create two frames, specifying that the border on one was to appear only at the right and at the bottom, and then positioning the two boxes one over the other. You can decide which box appears in front (or even make them transparent). I also selected a dark grey tint as the background for the box. I then entered the text for my title from the keyboard, put this in white, and created a new style sheet to get the appearance I wanted (see illustration) using the paragraph tool.

I then transferred an ASCII text file (one of the other articles in this issue of RISC User) into my document. This is a two stage process accomplished in frame mode, first accessing the text itself as it is necessary to fill each frame (in this case column) in turn. A dashed line at the foot of a box indicates that more of the story still remains to be positioned. Unfortunately, if the box has a frame this indicator is invisible! Acorn DTP will accept any ASCII text file, and files from Edit or 1st Word Plus including any style information already included at that stage.

In my trial document I tried to level up the last two columns to finish about halfway down the page, but this proved impossible. Fine adjustments like this can usually be made by adjusting the leading by fractions of a point (itself 1/72 of an inch). Acorn DTP will only allow leading to be specified to a whole number of points; the same is true of font size, quite a limitation when fine adjustments are needed.

Another small touch which I found difficult to achieve was to align the first lines of text in each column to appear under my central title box. Spacing can be controlled by placing frames around frames, but precise alignment could not be achieved, again not very professional. The title to the article was styled and positioned, but I could not make it

move to the very top of the page, even when the top margin space in the relevant style sheet was set to zero. Recourse to the manual was little help on these points, but it appears that frames include a fixed amount of white space both inside and outside the frame to separate them from any text.



Creating a frame border

The text tool is used to enter text directly from the keyboard, and to edit it. There is a find (and replace) function, and the facility to cut (or copy) text to the clipboard, and to paste into the document text from the clipboard - you can also do this with frames including their contents. Text editing also controls kerning (the facility to alter the spacing between pairs of characters), and the use of a *soft hyphen* and a *fixed space*. I found that what editing I required was straightforward to achieve.

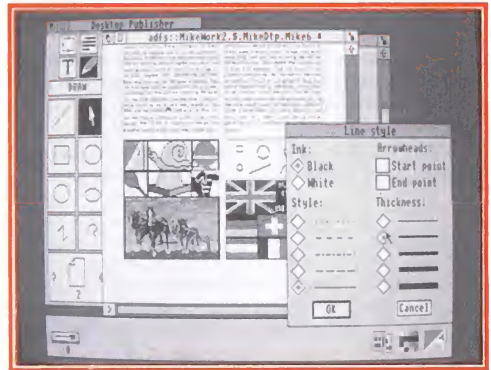
The final tool is for graphics or pictures. Acorn DTP can import two types of picture, *image* such as Paint might produce (in other words a *sprite*), and *line art* such as can be produced with Draw. Pictures of either type are loaded and positioned in boxes as with stories. Pictures can be rescaled or cropped, and the examples disc contains a good selection of both types. The graphics tool also allows a small number of lines and curves to be created within Acorn DTP (lines suitable for simple tables or diagrams, for example).

The printing of documents uses an improved set of the printer drivers supplied on the Applications disc, covering Epson dot

matrix and compatible printers, Postscript printers, the Integrex 132 colour printer, and HP Laserjet and compatibles. Acorn recommends you replace your existing printer drivers with these latest versions for all printing.

MAJOR CONSIDERATIONS

Although Acorn DTP will run on a 1MByte machine (i.e. a 310 or 410) you need to give careful consideration to the choice of a suitable system. First of all, the software makes frequent reference to a 'work disc'. Using a floppy, you will spend most of your time (literally) waiting for the screen display to be refreshed. Performance can be improved quite a lot by allocating adequate font cache (as Acorn recommend), and speed is then acceptable for occasional use, but I consider a hard disc (see this month's review) to be essential for anyone intending to make regular substantial use of Acorn DTP.



Using the graphics tool with line and image art

I ran Acorn DTP on a 310 with 1MByte of memory. I found that provided I restricted myself to text only (no pictures), memory appeared to be sufficient. Incorporating pictures onto the page was also trouble-free at first, but any attempt to resize or crop a picture was unsuccessful because of insufficient memory. At least Acorn DTP coped without collapsing completely, but if you want to incorporate many pictures into your documents (particularly sprites) then I suggest that 2MBytes of memory are the minimum, and that means a 420, 440 or an A3000 upgraded to 2MBytes.

It also helps on a 1MByte machine to carry out all the editing without a printer driver installed, to save memory, using the printer driver only when printout is actually required. Again, with 2MBytes or more this constraint would disappear. In fact, system tuning is quite important to get the best performance from a product such as Acorn DTP, but to their credit, Acorn has provided detailed information on this.

There are also factors about Acorn DTP itself which you should be aware of. I have already mentioned the restriction to integer point sizes, which is much too large for the detailed adjustment needed for a really professional design. There are at present only five fonts available (one sans serif, three serif and one, usefully, of symbols), though using Acorn's new *outline* fonts for improved appearance. Only four styles of border can be added to a frame, and there is no frame editor. In addition you cannot control the amount of space separating a frame from the text inside or outside. There are separate clipboards for frames, text etc. but you cannot check what is on any clipboard. Style sheets only apply to paragraphs, not to selected blocks of text, so changing style through a document can involve changing the style sheet for each individual paragraph. Other limitations may also exist.

Menus use the standard approach of showing in bold options which are available, and in grey those which aren't. However, the main menu always shows all options in bold regardless of which tool or mode is current. You can, for example, select *text* from the main menu, only to find that in the text menu no options are available because you are not in text mode. To change mode means that Acorn DTP has to remove all menus and re-display the view of the current page. I know this conforms with Acorn's own guidelines, but it is frustrating nevertheless.

In fact, the degree to which Acorn DTP reconstructs the view of the current page is excessive. For example, using *find & replace* to search for a word which appeared twice in the text visible on the screen resulted in Acorn DTP refreshing the entire screen display on both occasions, although the only changes were to display the first occurrence of the word, and then the second, in inverse video. I cannot believe that it has to be as bad as it appears,

though it may derive from the parentage of Acorn DTP on rather more primitive systems. However, this is only apparent when using a floppy-based system; with a hard disc all screen refreshes are commendably quick.

Lastly, I encountered two actual bugs. Highlighting one title line in order to change point size resulted in further characters of the next line becoming highlighted, such that any further changes of style applied to these too. This was consistently reproducible. On one occasion, loading a picture file from the supplied examples disc resulted in meaningless error messages and a completely hung machine from which the only escape was to press Ctrl-Break, causing the complete loss of all changes made to my current document since the time when it was last saved. Acorn says the latter can arise in any situation where your machine is working at its limits, and that it is not anything within DTP itself.

DOCUMENTATION

This is well written and produced, but the tutorial section is too short to give you real confidence in using the software, yet I feel that the reference section is too brief and lacking in really detailed information which might compensate. A package on this scale surely demands better coverage.

CONCLUSIONS

To what extent the limitations of Acorn DTP reflect those in the original PC version I do not know. You will just have to decide whether what is offered is adequate for your needs. My view at this time, is that you should not rush into buying Acorn Desktop Publisher, costing as it does a substantial £170 plus, until you have been able to examine some of the other offerings which will be appearing soon. You might also be interested to learn that Timeworks for the PC market costs under £90!

Product	Acorn Desktop Publisher
Supplier	Acorn Computers Cambridge Technopark 645 Newmarket Road, Cambridge CB5 8PD. Tel. (0223) 241144
Price	£171.35 inc. VAT (£162.78 to RISC User members direct from BEEBUG - add £3 for p&p.)

Archimedes Visuals

This short program by S.S.Pardesi illustrates the power of the Archimedes when applied to the technique of inbetweening.

Inbetweening

If you are unfamiliar with the term inbetweening, you will probably have seen the effect as it is used not infrequently on television in title sequences and the like. In essence, inbetweening involves defining two shapes, and then generating a series of intermediate shapes so that one object appears to be transformed step by step into the other. Visually it is often only quite near the end of the process that the new shape reveals itself meaningfully to the watcher.

Of course, the larger the number of steps taken, and the smaller the change from one position to the next, the smoother and more impressive the transformation appears. That's where the power of the Archimedes comes in.

The program listed here is really only a demonstration of the technique using wire-frame shapes, and can be developed considerably if required. Type the program in and save it away. When run, it asks you to define the first shape using the mouse. Move the pointer to a suitable starting position and press Select. Now continue to move the pointer, pressing Select at each corner, until you reach the last point you want to include in your definition, when you should press Adjust.

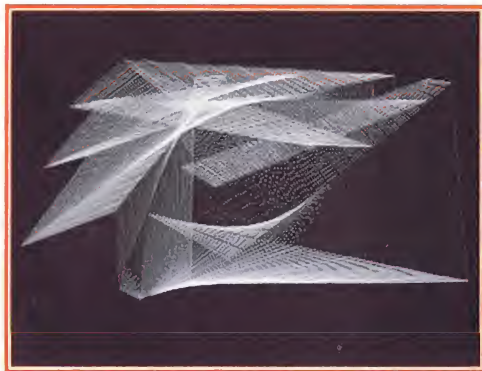
Once you have completed the first shape, you will be asked to define the second. The second shape MUST have the same number of defined points as the first. For this reason, there is no need to press Adjust rather than Select on the last point, as the program will have been counting the number of points entered.

Once both shapes have been defined, the program immediately commences transforming from one to the other, and then back again, repeating the whole process indefinitely. Pressing any mouse button during this time will return you to the starting point of the program ready to define two new shapes. Pressing Escape will exit from the program altogether.

If you define both shapes in the same position on the screen then one object gradually turns into the other. If you define one shape to the left of the screen, and the other to the right then you will see the object moving across the screen as the changes occur. If you find you need fewer points in one shape than the other, then several points can all be defined in the same position and will appear as a single point on the screen.

In the program, the arrays are dimensioned sufficient for 100 points, and 100 steps are used in transforming from one to the other. Both values are

set near the start of the program, and may be changed as required. The speed of transformation is artificially slowed down by the procedure PROCwait. Change the parameter used (smaller numbers mean faster speed), or the definition itself if you wish.



Our illustration shows a Christmas tree being transformed into a castle, but we are sure you will be able to find many more ingenious applications.

```
10 REM >Morph
20 REM Program Inbetweening
30 REM Version A 1.02
40 REM Author S.S.Pardesi
50 REM RISC User September 1989
60 REM Program Subject to Copyright
70 :
80 MODE 0:OFF
90 ON ERROR MODE12:PRINT REPORT$;" at li
ne ";ERL:END
100 lim=100:sec=100
110 DIM X1(lim,1),Y1(lim,1),X2(lim,1),Y2(lim,1),SX(lim,1),SY(lim,1)
120 *POINTER
130 MOUSE RECTANGLE 0,0,1279,800
140 REPEAT
150 CLS:p1=0:p2=0:f=0
160 PRINT TAB(2,1);"This program allows y
ou to draw two pictures, the computer will
then animate"
170 PRINT TAB(2,2);"one picture into the
other. To begin drawing, press the Select b
utton to plot"
180 PRINT TAB(2,3);"the points of your pi
cture, to end press the Adjust button."
190 PRINT TAB(10,5);"Number of points so
far: "
200 REPEAT
```

```
210 PROCdraw(X1(),Y1(),p1)
220 UNTIL bu=1
230 REM * DRAW SECOND SHAPE *
240 exit=FALSE:CLS:f=0
250 PRINT TAB(20,2);"Number of points in
FIRST picture: ";p1
260 PRINT TAB(20,4);"Number of points in
SECOND picture: "
270 REPEAT
280 PROCdraw(X2(),Y2(),p2)
290 UNTIL p2=p1
300 REM * CALC STEP SIZES *
310 FOR I=1 TO p1
320 SX(I,1)=(X1(I,1)-X2(I,1))/sec)
330 SY(I,1)=(Y1(I,1)-Y2(I,1))/sec)
340 NEXT I
350 REM * TRANSFORM SHAPES *
360 exit=FALSE
370 REPEAT
380 PROCtransform(1,sec-1,1,1,p1-1,1)
390 IF NOT exit PROCTransform(sec-1,1,-1,
p1-1,1,-1)
400 UNTIL exit
410 UNTIL FALSE
420 END
430 :
440 DEF PROCTransform(I1,I2,IS,J1,J2,JS)

450 FOR I=I1 TO I2 STEP IS
460 FOR J=J1 TO J2 STEP JS
470 LINE X2(J,1)+(SX(J,1)*I),Y2(J,1)+(SY(
J,1)*I),X2(J+1,1)+(SX(J+1,1)*I),Y2(J+1,1)+(
SY(J+1,1)*I)
480 MOUSE xpos,ypos,bu
490 IF bu<>0 THEN J=JS+1:I=IS+1:exit=TRUE
500 NEXT J
510 WAIT:PROCwait(0.3):CLS
520 NEXT I
530 ENDPROC
540 :
550 DEF PROCdraw(X(),Y(),RETURN p)
560 MOUSE xpos,ypos,bu
570 IF f=0 THEN MOVE xpos,ypos
580 IF bu=4 OR bu=1 THEN
590 DRAW xpos,ypos
600 p=p+1:f=1
610 X(p,1)=xpos:Y(p,1)=ypos
620 PROCwait(5)
630 PRINT TAB(36,5);p
640 ENDIF
650 ENDPROC
660 :
670 DEF PROCwait(t):endt=4*t
680 TIME=0:REPEAT:UNTIL TIME>endt
690 ENDPROC
```

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RISC USER DESKTOP DIARY

Missing the diary feature from the Arthur Desktop? Mike Ironmonger goes one better with a fully multi-tasking version for use under RISC OS.

This article, with part two to follow next month, describes a useful diary facility to add to your RISC OS Desktop. The program runs from an application directory, and uses all the standard Desktop features. When installed, the diary icon appears on the menu bar. Clicking on this icon opens the diary window to display a calendar for a single month. Two arrows at the top allow you to move through the months in steps of a month (using Select), or a year (use Adjust).

Whenever the current date is on display, this is highlighted by a black border, while any date for which an entry exists is highlighted with a grey background. Clicking the Menu button on the diary window opens up a menu with the following options:

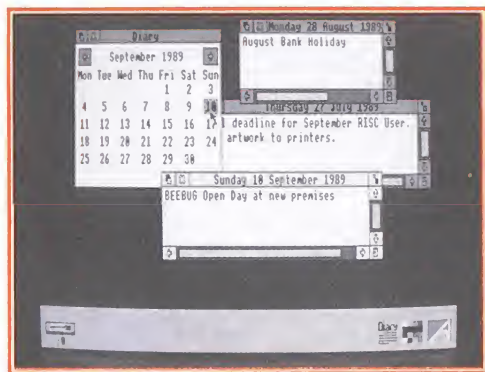
- Go to the current date**
- Save all entries**
- Print entries for the currently displayed month**
- Print entries for the currently displayed year**
- Print all entries**

As with all Wimp menus, choosing an item from the menu with the Adjust button (rather than with Select) will leave the menu in place.

Clicking on a date with an entry opens a window showing that entry, which can then be edited. Clicking on a date with no entry highlights the date and opens an empty window ready for some new text. The entry window allows four lines of 40 characters, with the name of the day and the date forming the window title. Up to 10 such windows may be open at any one time, for cross referencing entries for different dates.

When editing an entry, the standard text caret is shown and this may be moved up, down, left or right with the cursor keys. Home takes you to the start of the first line while Return takes you to the start of the next line, unless you are already on the last line. The mouse pointer can also be used to position the text caret in the window. Text is entered from the keyboard as required, and Delete works as expected. Pressing the Menu button over an entry window displays a menu allowing you to clear all text (in the window), delete the entry completely (including the window), or print the entry.

All entries are saved to a single file for subsequent reloading, though you can create as many separate diary files as you wish. Saving and loading follows RISC OS standards. To load a diary file, double click on its icon, or drag it onto the Diary icon on the menu bar (once installed). If a file is loaded which has an entry for the current date then a window will automatically be opened showing that entry. However, dragging a diary file into the calendar window or an entry window, will merge the entries in that file with those already loaded and present, overwriting existing entries where necessary.



The Desktop Diary in action

Diary files use the same file type as the old Arthur Desktop Diary, but the new diary files use a different and much more compact format. As a result, Arthur diary files cannot be loaded directly into the new diary application, but a conversion program, called Converter, is included on the magazine disc to perform just this task. When run, it asks for the name and year of the existing file, and a new name for the diary file. The old diary file is then loaded, converted to the new format, and then saved with the new name.

SETTING UP THE APPLICATION

You will need to create a directory called !Diary (just click on the drive icon, and then press Menu over the resulting directory viewer and choose the new directory option

from the menu) in which to save four files, !Boot and !Run (both Obey files), !Sprite (the sprite file) and !RunImage (the runnable program itself). Listing 1 is the boot file, and this should be created using Edit (press Menu on its icon on the icon bar and create a new Obey file). Save this as file !Boot in directory !Diary. Similarly, type in Listing 2 to create the Obey file !Run which should also be saved in your !Diary directory.

Listing 1

```
| !Boot file for Diary program
| by Mike Ironmonger
Set FileType_FEF Diary
Set Alias$@RunType_FEF Run <Obey$Dir>.!Run %*0
IconSprites <Obey$Dir>.!Sprites
```

Listing 2

```
| !Run file for Diary program
| by Mike Ironmonger
Set FileType_FEF Diary
Set Alias$@RunType_FEF Run <Obey$Dir>.!Run %*0
IconSprites <Obey$Dir>.!Sprites
WimpSlot -min 64K -max 64K
Run <Obey$Dir>.!RunImage %*0
```

Listing 3 is a short program which you will need to run to create the !Sprite file. Before you do this you will need to load the font Trinity from Applications disc 1 (Apps1). The program SpriteMake creates two sprites (using the letter 'D' from the Trinity font), one to represent the Diary program (in a directory viewer and on the icon bar), and a second for diary files. Unfortunately, there is no simple way in a magazine to create more complex sprites, but the magazine disc contains a !Sprite file with more elaborate icons. If you are typing in the program yourself, you may wish to use ArcPaint to create more detailed sprites of your own design. These should be called !Diary and file_fef, and designed in mode 12 with the Desktop palette to a size of 34 by 17 graphics units. The !Sprite file on the magazine disc also contains equivalent small icons called sm!diary and sm_fef.

Listing 3

```
10 REM > SpriteMake
20 MODE12:GCOL 129:CLG
30 SYS "Font_FindFont",,"Trinity.Medi
um",30*16,30*16 TO A%
40 SYS "Font_FindFont",,"Trinity.Medi
um",24*16,24*16 TO B%
```

```
50 SYS "Font_SetFontColours",A%,1,2,5
60 SYS "Font_Paint",,"D",16,12,8
70 MOVE 0,0:MOVE 66,64:*SGET !diary
80 GCOL128:CLG
90 SYS "Font_SetFontColours",B%,0,1,6
100 SYS "Font_Paint",,"D",16,14,16
110 GCOL7
120 LINE 0,0,66,0:DRAW 66,64
130 DRAW 0,64:DRAW 0,0
140 MOVE 0,0:MOVE 66,64:*SGET file_fef
150 **SAVE !Sprites
```

The last listing is part one of the program proper, which should be typed in and saved in the !Diary directory with the name !RunImage. I suggest you also save a separate copy of this program under the name Split1 to which part two can be appended next month. This month's program implements the calendar only, without the facility for making text entries. The additional code to provide these features will be added next month. Once all four files have been saved in the directory !Diary, double clicking on the !Diary icon from the Desktop will install the diary program as an application with its icon on the menu bar. Clicking on the menu bar icon will run the diary application as described above.

Line 90 in the program is designed to assist in trapping any errors that may arise as a result of mis-typing the program listing. Once you are confident that all is working as it should be, change this line to read:

```
90 ON ERROR PROCerror(ERR,REPORT$)
```

Next month, in addition to the remaining code which adds the text entry and printing facilities, we will be providing some information about the workings of the Diary program itself.

Listing 4

```
10 REM >$$.Split1
20 REM Program Desktop Diary
30 REM Version A 2.51
40 REM Author Mike Ironmonger
50 REM RISC User September 1989
60 REM Program Subject To Copyright
70 :
80 PROCInitialise
90 ON ERROR VDU4:PRINT REPORT$;" at 1
ine ";ERL:END
100 :
110 REPEAT
```



```

120 SYS "Wimp_Poll",51,block% TO A%
130 CASE A% OF
140 WHEN 2 : SYS "Wimp_OpenWindow",,b
lock%
150 WHEN 3 : PROCclose_window(!block%
,FALSE)
160 WHEN 6 : PROCbutton_click(block%!
8,block%!12,block%!16)
190 WHEN 9 : PROCmenu_select(!block%,
block%!4)
200 WHEN 17,18 : PROCreceive(block%!1
6)
210 ENDCASE
220 UNTIL quit%
230 SYS "Wimp_CloseDown"
240 END
250 :
260 DEFPROCclose_window(W%,del%)
350 !block%=W%:SYS "Wimp_CloseWindow",
,block%
360 ENDPROC
370 :
380 DEFPROCbutton_click(B%,W%,I%)
390 CASE B% OF
400 WHEN 1 : PROCsa_click(12)
410 WHEN 2 : PROCmenu_click(W%,!block
%,block%!4+12)
420 WHEN 4 : PROCsa_click(1)
440 ENDCASE
450 ENDPROC
460 :
700 DEFPROCmenu_select(A%,B%)
710 SYS "Wimp_GetPointerInfo",,block%:
stay%=block%!8=1
720 CASE mw% OF
730 WHEN -2 : IF A%=0 quit%=TRUE
740 WHEN w_diary% : CASE A% OF
750 WHEN 0 : PROCnew_month((today%>>
8)-month%)
770 ENDCASE
830 ENDCASE
840 IF stay% PROCmenu_click(mw%,mx%,my
%)
850 ENDPROC
860 :
870 DEFPROCreceive(M%)
880 CASE M% OF
890 WHEN 0 : quit%=TRUE
920 ENDCASE
930 ENDPROC
940 :
950 DEFPROCsa_click(inc%)
960 CASE W% OF
970 WHEN -2 : PROCnew_month(0):PROCop
en_window(w_diary%)

```

```

990 WHEN w_diary% : CASE I% OF
1000 WHEN 0 : PROCnew_month(-inc%)
1010 WHEN 1 : PROCnew_month(inc%)
1030 ENDCASE
1040 ENDCASE
1050 ENDPROC
1060 :
1070 DEFPROCmenu_click(W%,X%,Y%)
1080 mw%=W%:mx%=X%:my%=Y%
1090 CASE W% OF
1100 WHEN -2 : PROCmaster_menu("Diary"
,"Quit",,X%,140)
1110 WHEN w_diary% : PROCmaster_menu("
Diary","Goto today,Save notes,Print note
s",,X%,Y%)
1130 ENDCASE
1140 ENDPROC
1150 :
1290 DEFPROCnew_month(inc%)
1300 IF month%+inc%<0 ENDPROC
1310 block%!0=w_diary%:FORI%=4TO34:bloc
k%!4=I%:SYS "Wimp_DeleteIcon",,block%:NE
XT
1320 month%+=inc%
1330 m%=month% MOD 12:y%=month% DIV 12
1340 $month_buff%=(month$(m%)+ " "+STR$y%
1350 PROCset_icon_state(w_diary%,3,0,0)
1360 X%=8+FNday(y%,m%,1)*64:Y%=-152
1370 FORD%=(1TONum_days(m%)-(m%=1 AND F
Nleap_year(y%))
1380 E%=(month%<<8)+D%
1390 B%=FNicon(w_diary%,STR$D%,X%,Y%,44
,44,&27003009)
1400 X%+=64:IF X%=456 X%=8:Y%=-48
1410 NEXT
1420 SYS "Wimp_ForceRedraw",w_diary%,8,
-392,436,-108
1430 T%=FNtoday:IF T%>today% today%=T%
1440 IF month%=(today%>>8) PROCset_icon
_state(w_diary%,3+today%AND255,4,4)
1450 ENDPROC
1460 :
2240 DEFFNleap_year(Y%)
2250 =(0=Y%MOD4 AND (Y%MOD100<>0 OR Y%M
OD400=0))
2260 DEFFNday(Y%,M%,D%)
2270 =(365*Y%+Y%DIV4-Y%DIV100+Y%DIV400+
days_so_far%(M%)+(M%<2 AND FNleap_year(Y
%))-2+D%)MOD7
2980 DEFPROCset_icon_state(!block%,bloc
k%!4,block%!8,block%!12)
2990 SYS "Wimp_SetIconState",,block%
3000 ENDPROC
3010 :
3150 DEFFNtoday

```

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```

3160 ?block%=1:SYS "OS_Word",14,block%
3170 A%=?block%:Y%=10*(A%>>4)+(A%AND15)
3180 A%=block%?1:M%=22799+Y%*12+10*(A%>
4)+(A%AND15)
3190 A%=block%?2
3200 =(M%<<8)+10*(A%>>4)+(A%AND15)
3210 :
3220 DEFPROCError(!block%,$(block%+4))
3230 SYS "Wimp_ReportError",block%,1,"D
iary"
3240 ENDPROC
3250 :
3260 DEFPROCInitialise
3270 DIM block% 90,menu% 400
3290 DIM month$(11),num_days$(11)
3300 DIM days_so_far$(11),day$(6)
3310 month$()="January","February","Mar
ch","April","May","June","July","August"
,"September","October","November","Decem
ber"
3320 num_days$()=31,28,31,30,31,30,31,3
1,30,31,30,31
3330 days_so_far$()=0,31,59,90,120,151,
181,212,243,273,304,334
3340 day$()="Monday","Tuesday","Wednesd
ay","Thursday","Friday","Saturday","Sund
ay"
3350 :
3360 today%=FNtoday:month%=today%>>8
3370 quit%=FALSE
3380 :
3390 SYS "Wimp_Initialise",200,&4B53415
4,"Diary"
3400 A%=FNind_icon(-1,A%,1,7,"!diary",0
,0,58,68,&3102)
3410 w_diary%=FNcreate_window("Diary
",A%,0,130,884,444,400,0,13,19)
3420 A%=FNicon(w_diary%,CHR$136,8,-64,4
4,52,&2700203D)
3430 A%=FNicon(w_diary%,CHR$137,392,-64
,44,52,&2700203D)
3440 A%=FNind_icon(w_diary%,A%,-1,28,"M
on Tue Wed Thu Fri Sat Sun",0,-108,450,3
6,&7000101)
3450 A%=FNind_icon(w_diary%,month_buff%
,-1,15,"",102,-56,240,36,&7000109)
3460 :
3610 ENDPROC
3620 :
3630 DEFNcreate_window(title$,RETURN b
uff$,len%,X%,Y%,W%,H%,bg%,hg%,F%)
3640 $block%=STRING$(88,CHR$0)
3650 !block%=X%:block%!4=Y%-H%
3660 block%!8=X%+W%:block%!12=Y%
3670 block%!28=F%:block%!32=&207

3680 block%?35=bg%:block%!36=&103
3690 block%?38=hg%:block%!44=-H%
3700 block%!48=W%:block%!56=&19
3710 $(block%+72)=title$
3720 IF len%>0 DIM buff% len%:block%!56
=&119:block%!72=buff%:block%!76=-1:block
%!80=len%
3730 SYS "Wimp_CreateWindow",,block% TO
H%
3740 =H%
3750 :
3760 DEFPROCOpen_window(!block%)
3770 SYS "Wimp_GetWindowState",,block%
3780 block%!28=-1:SYS "Wimp_OpenWindow"
,,block%
3790 ENDPROC
3800 :
3810 DEFNicon(!block%,text$,L%,B%,W%,H
%,block%!20)
3820 block%!4=L%:block%!8=B%
3830 block%!12=L%+W%:block%!16=B%+H%
3840 IF text$<>" " $(block%+24)=text$
3850 SYS "Wimp_CreateIcon",,block% TO I
%
3860 =I%
3870 :
3880 DEFNind_icon(window%,RETURN buff%
,block%!28,len%,text$,L%,B%,W%,H%,F%)
3890 IF buff%<&8000 DIM buff% len%
3900 block%!24=buff%:block%!32=len%
3910 IF text$<>" " $buff%=text$
3920 =FNicon(window%,"",L%,B%,W%,H%,F%)
3930 :
3940 DEFPROCmaster_menu(title$,m$,X%,Y%
)
3950 PROCcreate_menu(menu%,title$,m$)
3960 SYS "Wimp_CreateMenu",,menu%,X%-me
nu%!16/2,Y%
3970 ENDPROC
3980 :
3990 DEFPROCcreate_menu(M%,title$,m$)
4000 LOCAL I%,max%
4010 $M%=title$:M%!12=&70207
4020 M%!20=&44:M%!24=0
4030 I%=M%+28:max%=LEN(title$)-2
4040 REPEAT
4050 A%=INSTR(m$,""):IF A%>max% max%=
A%
4060 !I%=0:I%!4=0
4070 $(I%+12)=LEFT$(m$,A%-1)
4080 m$=MID$(m$,A%+1)
4140 I%!8=&7000021:I%+=24
4150 UNTIL m$=""
4160 I%!-24=&80:M%!16=max%*16
4170 ENDPROC

```

TimeWatch

TimeWatch provides the tools to manage appointments, a 'To Do' list of tasks, and jogs the memory for those important birthdays and anniversaries. TimeWatch retains your information in pages – there is a page for each day of the year, for as many years as desired.



Appointments. Appointments for the day are detailed by start time, estimated duration and a descriptive note. All appointments for the day are displayed in time sequence.



Short Notes. Useful for jotting down a quick reminder, or notes of a telephone conversation.



Tasks to do. TimeWatch will help you plan your time and keep track of outstanding work by displaying your details of tasks in one of the categories 'Start Today', 'Ongoing' or 'Overdue!'.



Birthdays, anniversaries etc. Don't forget those things that should not be forgotten. Details entered in this category will appear on the same page for all years.

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TimeWatch can also search for a piece of text in any, or all, of your categories of information; print some, or all, of the information stored in a range of pages; and, by means of the perpetual calendar, move quickly from one page to another.

For those who have made use of the Arthur 1.2 DeskTop Diary, TimeWatch will import the contents of the diary files.

DiscTree



provides comprehensive, and easy to use, facilities to display the directory structure of a disc, search for files and backup files.

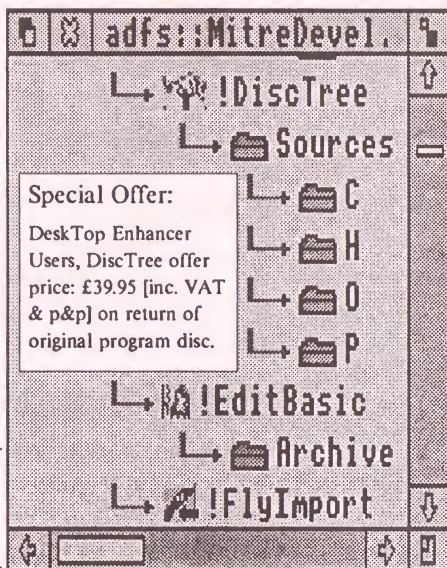
A TreeViewer provides the means to move rapidly around the directory structure of a disc and search for files. After specifying the directories to search, name and type to match the files found will be displayed, ready for loading into an editor.



A backup is performed after specifying the directories to search, file name, type and date to match. These criteria may be saved to a script file for fast and easy repeated use.



Backup copies files matching your criteria to floppy discs. Files are spread over many discs if required. Restore displays the contents of backup discs and allows the restoration of files by dragging to the required destination, or automatic restoration to their original locations.



DiscTree and TimeWatch are written specifically for RISC OS desktop and make full use of the WIMP, multi-tasking and inter application communication.

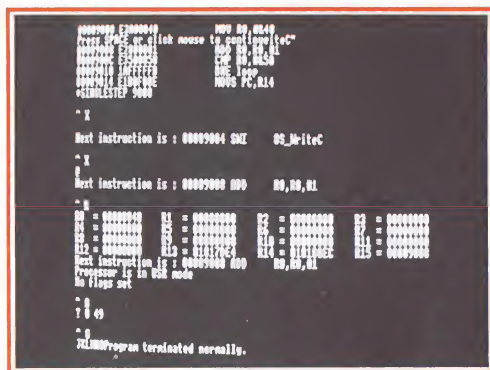
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Prices: DiscTree: £49.95. TimeWatch: £29.95 [inc. VAT and p&p].

ARM CODE SINGLE STEPPER

Debugging a program written in machine code on any computer can be an absolute nightmare, and ARM code is no exception. Whether the elusive bug is a subtle one that causes the program to provide erroneous results, or a real humdinger which crashes the whole system, it can take ages just to find out where the bug is, let alone put it right. One aid to debugging that can prove a godsend is a single stepper. Quite simply, what this does is to allow a program to be executed one instruction at a time, giving you the opportunity to examine the contents of memory and the processor registers after each instruction. This makes it much easier to identify where a problem has occurred.



```

SINGLESTEP
Enter address to continue:
Enter command:
R      Display registers
A      Alter register
Space  Execute next instruction
G      Continue execution
0,1,2  Set automatic display level
N,Z,C,V,I,F Toggle flags
*      OS Command
Escape Terminate execution

Next instruction is : 00003004 SWI OS_WriteC

Next instruction is : 00003000 ADD R0,R0,R1

R0 = 00000000 R1 = 00000000 R2 = 00000000 R3 = 00000000
R4 = 00000000 R5 = 00000000 R6 = 00000000 R7 = 00000000
R8 = 00000000 R9 = 00000000 R10 = 00000000 R11 = 00000000
R12 = 00000000 R13 = 00000000 R14 = 00000000 R15 = 00000000

Next instruction is : 00003000 ADD R0,R0,R1
Program is in halt mode
Press key to continue:
Program terminated normally.
```

The single stepper in action

The program presented here is just such a utility, which is itself written in machine code in the form of a relocatable module. To use the module, enter the listing and save it. When run, the program will assemble the module and save it with the filename 'SSTEP'. The module can then be installed by typing QUIT (to exit from Basic) followed by SSTEP.

The SSTEP module provides a single command:

*SINGLESTEP <address>

which enters the single stepper ready to step through from the given address, which should be in hex. At this point you are presented with a 'A' as a prompt, which

signifies that the stepper is waiting for one of several single character commands to be entered. The possible commands are:

R	Display registers
A	Alter register
Space bar	Execute next instruction
G	Continue execution
0,1,2	Set automatic display level
N,Z,C,V,I,F	Toggle flags
*	OS Command
Escape	Terminate execution

Most of the commands should be fairly self-explanatory. Perhaps the most important one is 'Space', which causes the next instruction to be executed. Initially, the 'next' instruction will be the instruction at the address specified in the *SingleStep command. Normally, the program will be stepped through one instruction at a time. However, in the case of a Branch with Link (BL) instruction, you are given the option of whether you wish to trace the subroutine or not. If you answer no, then the entire subroutine will be treated as a single instruction. SWI calls are always treated as a single instruction.

In some cases, you may wish to step through the first part of a machine code program, and then when you are satisfied with the operation, allow the program to run as normal. To do this, use the 'G' command instead of 'Space'. In this case, control of the program cannot be regained. Whenever a program executed via *SINGLESTEP terminates, a message to that effect will be displayed, and if an error occurs, this is displayed too. While single stepping, you can exit from the program prematurely by pressing Escape.

The commands '0', '1' and '2' control what information is displayed after each instruction is executed. Level '0' causes no display, while level '1' will display just the next instruction, and level '2' will display the next instruction and a dump of the register contents. The default is level '1'.

The 'R' command will list the current contents of all the registers, together with the next instruction to be executed, the processor

ARM CODE SINGLE STEPPER

mode, and the flag settings. To alter the contents of any register you can use the 'A' command. Selecting this will produce a '?' prompt. You should now enter the register number (in decimal), and the new value for it (in hex), separated by a space. For example:

```
1 31FFC
```

will set register R1 to &31FFC. A special case is if the register number is entered as 'P'. In this case, the Program Counter (PC) is altered without affecting the status bits in register R15. Therefore, this effectively performs a jump operation to alter the flow of control. To toggle the contents of the flags directly, press the key corresponding to the flag, thus:

```
N Negative flag
Z Zero flag
C Carry flag
V Overflow flag
I Interrupt disable flag
F Fast interrupt disable flag
```

For editing memory, any star command can be issued. You could for example, use the memory editor built into the RISC User Toolbox, or the *MEMORYA command supported by the RISC OS Debugger module.

Should you wish to start debugging part way through a program, then this can be done by embedding a SWI call in your machine code, rather than using the *SINGLESTEP command. The SWI used is:

```
SWI "SingleStep_StartStep"
```

and has the number &C0800. When this SWI is executed, the single stepper will be entered at the instruction immediately after the SWI. The registers will be retained exactly as they were before the SWI. You can then step through the remainder of the program exactly as for *SINGLESTEP.

If you wish to study the workings of the single step module, then this month's magazine disc contains a fully commented version of the source code. See the inside-back cover for ordering details.

```
10 REM > SingleP
20 REM Program Single Stepper
30 REM Version A 1.0
40 REM Author David Spencer
50 REM RISC User September 1989
```

```
60 REM Program Subject to Copyright
70 :
80 DIM code 3000
90 FOR pass=4 TO 7 STEP 3
100 0%=code:P%=0
110 [OPT pass:EQU0 0:EQU0 init
120 EQU0 0:EQU0 0:EQU0 title
130 EQU0 help:EQU0 commtab:EQU0 &C0800
140 EQU0 swi:EQU0 switab
150 .switab EQU0 "SingleStep":EQU0 0
160 EQU0 "StartStep":EQU0 0:EQU0 0
170 .title
180 EQU0 "SingleStepper":EQU0 0
190 .help
200 EQU0 "Single Stepper":EQU0 9
210 EQU0 "1.00 (21 Jun 1989)":EQU0 0
220 ALIGN
230 .commtab
240 EQU0 "Singlestep":EQU0 0:ALIGN
250 EQU0 step:EQU0 &10001:EQU0 ssyn
260 EQU0 shelp:EQU0 0:ALIGN
270 .shelp
280 EQU0 "*Singlestep invokes the mach
ine code single stepper.":EQU0 13
290 .ssyn
300 EQU0 "Syntax: Singlestep <start ad
dress>":EQU0 0:ALIGN
310 .init MOV R6,R14:MOV R3,#1024
320 MOV R0,#6:SWI "XOS_Module"
330 MOVVS PC,R6:STR R2,[R12]
340 MOV R0,#0:STRB R0,[R2,#169]
350 MOVVS PC,R6
360 .swi CMP R11,#0:MOVNES PC,R14
370 LDR R12,[R12]:LDRB R11,[R12,#169]
380 CMP R11,#0:MOVNES PC,R14
390 STR R14,[R12,#14*4]
400 BIC R14,R14,#&FC000003
410 STR R14,[R12,#172]
420 LDR R14,[R13,#4]
430 BIC R2,R14,#&FC000003
440 STR R2,[R12,#15*4]
450 STMIA R12,{R0-R10}:B step2
460 .step LDR R12,[R12]
470 LDRB R1,[R12,#169]:CMP R1,#0
480 MOVNES PC,R14:STMF D R13!,{R14}
490 MOV R1,R0:MOV R0,#16
500 ORR R0,R0,#1<<31
510 SWI "XOS_ReadUnsigned"
520 LDMVSFD R13!,{PC}
530 BIC R2,R2,#&FC000003
540 STR R2,[R12,#15*4]:MOV R0,#0
550 MOV R1,#0
560 .clear STR R0,[R12,R1]
```



```

570 ADD R1,R1,#4:CMP R1,#13*4
580 BNE clear:ADR R14,terminate
590 STR R14,[R12,#14*4]
600 .step2 ADD R0,R12,#1024
610 STR R0,[R12,#13*4]
620 MOV R0,#patchend-patch
630 ADR R1,patch:ADD R2,R12,#68
640 .setpatch LDR R3,[R1],#4
650 STR R3,[R2],#4:SUBS R0,R0,#4
660 BNE setpatch:MOV R1,#1
670 STRB R1,[R12,#168]
680 STRB R1,[R12,#169]:MOV R1,#0
690 STRB R1,[R12,#170]
700 STR R13,[R12,#64]:B main
710 .patch STR R12,r12save
720 STR R13,r13save
730 LDR R0,[R12,#15*4]
740 AND R0,R0,#&FC000003:MOV R1,R12
750 TEQP R0,#0:MOVNV R0,R0
760 LDMIA R1,{R0-R14}
770 .here
780 LDR PC,[PC,#-(here+8-patch+8)]
790 .getback STR R14,[PC,#-(getback+8-
patch+12)]:BL nextinst
800 .nextinst STR R14,[PC,#-(nextinst+
8-patch+8)]
810 .here3
820 SUB R14,PC,#here3+8-patch+68
830 STMIA R14,{R0-R13}
840 SWI "OS_EnterOS":LDR R12,r12save
850 LDR R13,r13save:LDR PC,return
860 .return EQU D 0
870 .r12save EQU D 0
880 .r13save EQU D 0
890 .patchend
900 .main SWI &10A:SWI &10D
910 SWI &100+ASC"^":SWI &120
920 SWI "OS_ReadC":BCC notesc
930 MOV R0,#&7E:SWI "OS_Byte":B quit
940 .notesc SWI "OS_WriteC"
950 CMP R0,#ASC" ":BEQ execute
960 CMP R0,#ASC"*":BEQ star
970 CMP R0,#ASC"0":BCC notmode
980 CMP R0,#ASC"2":BHI notmode
990 SUB R0,R0,#ASC"0"
1000 STRB R0,[R12,#168]:B main
1010 .notmode BIC R0,R0,#&20
1020 MOV R1,#1<<26:MOV R2,#5
1030 ADR R3,flags
1040 .checkforflags LDRB R4,[R3,R2]
1050 CMP R4,R0:LDREQ R0,[R12,#15*4]
1060 EOREQ R0,R0,R1
1070 STREQ R0,[R12,#15*4]:BEQ main

1080 MOV R1,R1,LSL #1:SUBS R2,R2,#1
1090 BPL checkforflags:CMP R0,#ASC"A"
1100 BEQ alter:CMP R0,#ASC"R"
1110 BEQ registers:CMP R0,#ASC"G"
1120 BEQ go:SWI "OS_Writes":EQUW &D0A
1130 EQUW "Unrecognised command"
1140 EQUW &D0A:EQUW 7:EQUW 0:B main
1150 .go MOV R1,#1:STRB R1,[R12,#170]
1160 B execute
1170 .terminate MOV R1,PC:TEQP PC,#0
1180 SWI "XOS_EnterOS":TST R1,#1<<28
1190 BNE error:SWI "XOS_Writes"
1200 EQUW "Program terminated normally.
":EQUW &D0A:EQUW 0
1210 LDMFD R13!,{R14}
1220 BICS PC,R14,#1<<28
1230 .error SWI "OS_Writes"
1240 EQUW "Program terminated with erro
r":EQUW &D0A:EQUW 0
1250 LDMFD R13!,{R14}
1260 ORRS PC,R14,#1<<28
1270 .quit LDR R13,[R12,#64]
1280 SWI "OS_Writes":EQUW &D0A
1290 EQUW "Execution aborted."
1300 EQUW &D0A:EQUW 0:MOV R0,#0
1310 STRB R0,[R12,#169]
1320 LDMFD R13!,{R14}
1330 BICS PC,R14,#1<<28
1340 :
1350 .star ADD R0,R12,#256:MOV R1,#256
1360 MOV R2,#ASC" ":MOV R3,#&FF
1370 SWI "OS_ReadLine":BCC noesc2
1380 .escsc MOV R0,#&7E:SWI "OS_Byte"
1390 SWI "OS_Writes":EQUW &D0A
1400 EQUW "Escape":EQUW &D0A:EQUW 0
1410 B main
1420 .noesc2 ADD R0,R12,#256
1430 SWI "XOS_CLI":BVC main
1440 ADD R0,R0,#4:SWI "OS_Write0"
1450 B regout
1460 :
1470 .registers SWI &10A:SWI &10D
1480 MOV R3,R12:MOV R4,#0
1490 .reg2 SWI &100+ASC"R":MOV R0,R4
1500 CMP R0,#10:SWICS &100+ASC"1"
1510 SUBCS R0,R0,#10:ADD R0,R0,#ASC"0"
1520 SWI "OS_WriteC":CMP R4,#10
1530 SWICC &120:SWI "OS_Writes"
1540 EQUW " ":EQUW 0:LDR R0,[R3],#4
1550 ADD R1,R12,#256:MOV R2,#9
1560 SWI "OS_ConvertHex8"
1570 SWI "OS_Write0":SWI "OS_Writes"

```

Continued on page 38

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BENCHMARKS (supplied on demo disc)

Program	BASIC V	RB1.70	ABC 2.29
REPEAT...UNTIL	8.10	0.08	0.25
WHILE...ENDWHILE	6.28	0.11	0.26
FOR...NEXT	15.00	1.34	0.00**
Ackerman(3,4)	3.30	0.27	0.07
Fibonacci(21)	4.83	0.72	0.26
Tak(18,12,6)	18.53	1.97	0.93
String swap	1.66	3.35	1.01
String Add	3.09	6.44	1.38
String Sort	3.95	3.02	0.19

BASIC V version 1.04 running in RAM. RiscBASIC and ABC speed improvement directives used throughout. **ABC can eliminate empty loops like this one.

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MASTERING THE WIMP

by Lee Calcraft

This month we begin a new series on the Archimedes Wimp system. If you want to understand the Wimp and exploit it in your programs, read on.

The Acorn Wimp is a very powerful and comprehensive piece of software available and accessible to all Archimedes users. It represents the state of the art in the excellent user interface which it creates. And more importantly it provides the means by which full co-operative multi-tasking is achieved on machines with RISC OS fitted.

If you are among those who write programs on the Archimedes, and have not yet come to grips with the Wimp, then there are many good reasons why you should. As well as enabling your programs to multi-task, the Wimp also greatly simplifies access to filing systems. If your program needs to operate on data files, you do not need to write any code to find or display files, or move around the directory structure of the ADFS or Econet: the Desktop filter provides all this, and allows you to drag data files onto an application icon to run them - and much more besides.

The Wimp presents the user with an easy-to-use, and intuitive interface. To the programmer it provides a very powerful structure within which to build his own code - which may be written in Basic, Assembler, or other high level languages such as C. The only real downside from the programmer's point of view is the complexity of the Wimp. But this is really quite unavoidable in view of the massive flexibility built into the system, as we will see in due course.

Because of this complexity, we will be treating the whole subject in a measured fashion, with the intention of spreading the introduction of new concepts throughout the series. To make this possible, we will gloss over a number of areas early in the series, returning to them at a later date to fill in the gaps.

Throughout the series we will be using Basic, and we will assume that you have RISC OS fitted in your machine (since the RISC OS Wimp is considerably more powerful than the Arthur Wimp). The best source of reference for the series will be the four-part RISC OS

Programmer's Reference Manual. Part two of the *Arthur Programmer's Reference Manual* constitutes a reasonable second best, but inevitably lacks information on the considerable RISC OS extensions to the Wimp. Should you have access to neither of these volumes, you should nevertheless find sufficient information within this series to make considerable use of the Wimp in your own programs.

WINDOWS

The acronym Wimp stands for Windows, Icons, Menus and Pointers. The software which handles this user interface in the Archimedes is a resident module called the Window Manager, often referred to as the Wimp. A typical window is shown in figure 1, and it is assumed that you are familiar with the effect of clicking the mouse when the pointer is over the various parts of the window. If not, switch on your machine, and find out!

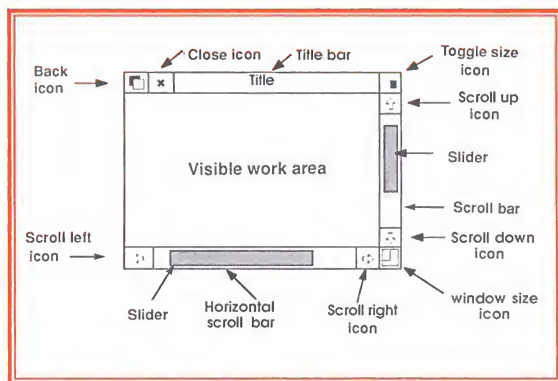


Figure 1. Archimedes window layout

The really excellent thing about the Acorn Wimp is that not only will it place windows on the screen exactly where you want them, but it will fully maintain them as well. For example, if the user drags a window to a new position on the screen, then the manager will handle this for you. Only if part of the window needs redrawing (as it would if it had previously been obscured by another

window) will your program need to do anything, and in such cases the Wimp will tell your program exactly which parts of the window need updating. This means of course that a dialogue must be struck up between your program and the Wimp, and we will see how this works in due course.

WIMP SYS CALLS

Virtually all access to the Wimp is via so-called SWI calls, or their Basic equivalent, the SYS call. If you are unfamiliar with SYS calls, you are referred to the brief article in this issue: *SYS Calls Explained*. There are a staggering 52 Wimp calls documented in the *RISC OS Programmer's Reference Manual*, but we will start by concentrating on the use of just nine of these - see table 1.

In very broad terms, a Wimp program will begin by making a call to `Wimp_Initialise`. This informs the Wimp of the existence of the new task (or program), and if the task has not been run from the Desktop, it will set up the mode, colour palette and pointer. At the same time, the Wimp issues the task with a so-called *task handle*. This is a number unique to that particular task, which may be used when referring to the task in future dialogues.

In order to open a window on the screen, the program must next make a call to `Wimp_CreateWindow`. In this call, the program provides a large block of data for the Wimp which precisely defines the window and the way in which it will behave. This block contains details of the exact size and position of the window, whether it has scroll bars, what its component colours are and so on.

Although it *defines* the window, this call does not cause it to be drawn on the screen. A second call, `Wimp_OpenWindow`, is used for this purpose. And even then, nothing will

actually appear until a so-called Wimp Poll takes place. The `Wimp_Poll` SWI call is central to the whole operation of the Wimp. It is this call which is used to maintain the dialogue between each particular task and the Wimp, and it is by means of this call that the Wimp achieves multi-tasking.

In all Wimp programs there must be a central routine which makes repeated calls to `Wimp_Poll`. The Window Manager responds to these calls by returning a value, called the *reason code*, to the calling program (or task), and the task in turn responds to this. The reason code may indicate that the user has clicked on an icon in the task's window, or that he has typed at the keyboard, or whatever. In any case, it is up to the task to interpret the reason code, react accordingly, and then call `Wimp_Poll` again to find out what to do next.

Unbeknown to each task, the Wimp multi-tasks through this `Wimp_Call`. What happens is that the Wimp returns to each task in turn, so that in the time between a task calling `Wimp_Poll`, and getting back a reason code, the Wimp has serviced each of the other concurrent tasks in turn. This is all handled completely by the Wimp, and all that each task must do is to call `Wimp_Poll` in a central REPEAT loop, and to respond as quickly as possible to the reason code which the Wimp returns, and then call `Wimp_Poll` again, so passing control back to the Window Manager.

It should be stressed at this point that *all* Wimp programs must behave in this way. No special code over and above this is needed to accomplish multi-tasking. Whether or not a Wimp program multi-tasks depends on the way in which it is called. If it is run from Basic, then it behaves as a straightforward Basic application. If it is run from the Desktop, then it will multi-task with any other programs currently running. For specific details on multi-tasking you are referred to the two-part article "Multi-Tasking with RISC OS" in RISC User Volume 2, Issues 3 and 4.

A SIMPLE PROGRAM

To see how this all works in practice, we will take a look at the program in listing 1. This creates and maintains a single resizable

<code>Wimp_Initialise</code>
<code>Wimp_CreateWindow</code>
<code>Wimp_OpenWindow</code>
<code>Wimp_GetWindowState</code>
<code>Wimp_Poll</code>
<code>Wimp_RedrawWindow</code>
<code>Wimp_GetRectangle</code>
<code>Wimp_CloseDown</code>
<code>Wimp_ReportError</code>

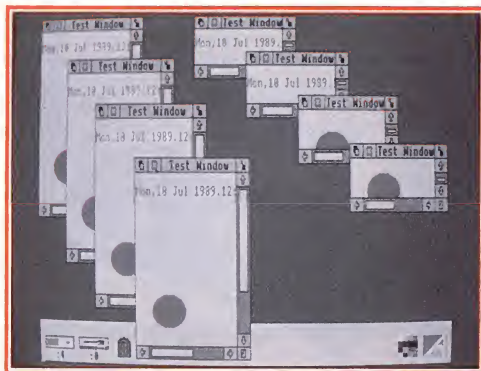
**Table 1. Some
commonly used
Wimp calls**

window containing text and graphics. To try the program, type it in carefully, and save it away before running it. There are two ways to run it: it can be run just like any other Basic program by **LOADing** it into RAM, and typing **RUN** (or combining the operations using **CHAIN**), or alternatively you can double click on the program's icon from the Desktop. The advantage of the former approach is that when you quit the program by clicking on the "X" icon at the left of the title bar, your program will still be in RAM, from where it may be edited, and re-run.

If you run the program from the Desktop, you will see that it multi-tasks happily with any other task currently running, but with the disadvantage that when you leave the Desktop (either by selecting Exit, or using Ctrl-Shift-F12), the program will not be recoverable, and must be re-loaded from disc if you wish to edit it.

Incidentally, if you are running the program from the Desktop, you will probably not be able to start up any further tasks once the program is running (including clones of the program itself), because there is insufficient RAM. This is because the RISC OS Task Manager has allocated large quantities of free RAM to the task. You can stop this from happening by invoking the Task Manager Window. Click with the Menu button over the "A" icon at the right hand side of the icon bar at the base of the screen, and allocate just 16 or 32K to the "Next task" before running the program. We will deal with a special call for allocating RAM to each task in a future issue (but if you need to know now, see the article "Creating RISC OS Application Directories" in RISC User Volume 2 Issue 4 page 20).

Next month we will look in some detail at this program, and see how the various Wimp calls are made. In the mean time you may like to experiment a little. First of all check that the program behaves itself correctly, in a multi-tasking environment. Do all the icons produce the expected result when clicked? Can the window be dragged properly? And can you spot the inconsistency in the way in which the window is updated? Running more than one copy of the program may make this clearer.



The test window is resizable, and may be scrolled. You can multi-task as many clones of it as you wish by repeatedly double-clicking on its icon from the Desktop.

If you want to experiment further, try altering the six parameters of FNcreate at line 220. The first two are the x and y co-ordinates of the bottom left hand corner of the visible part of the window. The second two are the width and height of the visible part of the window, and the last two are the x and y dimensions of the hidden part of the window i.e. the part of the window which is initially hidden, but which can be made to appear by clicking on the scroll bars or by resizing the window. More on all this next month.

```

10 REM                                >!RunImage
20 REM Program      Simple Wimp Demo
30 REM Version      A 0.12
40 REM Author       Lee Calcraft
50 REM RISC User    September 1989
60 REM Program      Subject to Copyright
70 :
80 DIM block% &200
90 ON ERROR PROCerror:END
100 :
110 quit%=FALSE
120 REM-----
130 REM              INITIALISE WIMP
140 REM-----
150 $block%="TASK"
160 SYS "Wimp_Initialise",200,!block%,
"Test" TO version%,task%
170 REM-----

```

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```

180 REM          CREATE WINDOW
190 REM-----
200 REM x,y,width,height,extx%,exty%
210 REM extx% & exty% are hidden parts
220 whandle%=FNcreate(200,200,300,500,
200,200)
230 REM-----
240 REM          OPEN WINDOW
250 REM-----
260 block%!0=whandle%
270 SYS "Wimp_GetWindowState",,block%
280 SYS "Wimp_OpenWindow",,block%
290 REM-----
300 REM          WIMP POLL
310 REM-----
320 ON ERROR IF FNwimperror THEN END
330 REPEAT
340 PROCpoll
350 UNTIL quit%
360 $block%="TASK"
370 SYS "Wimp_CloseDown",task%,!block%
380 END
390 REM-----
400 :
410 DEFPROCpoll
420 SYS "Wimp_Poll",,block% TO reason%
430 CASE reason% OF
440   WHEN 1      :!block%=whandle%:SYS
"Wimp_OpenWindow",,block%
460   WHEN 3      :quit%=TRUE
470   WHEN 17,18:IF block%!16=0 THEN q
uit%=TRUE
480 ENDCASE
490 ENDPROC
500 :
510 DEFFNcreate(vwx%,vwy%,vwv%,vwh%,ex
tx%,exty%)
520 $block%=STRING$(88,CHR$0):REM Clr
530 REM   Visible Work Area
540 block%!0=vwx%          :REM x1
550 block%!4=vwy%          :REM y1
560 block%!8=vwx%+vwv%     :REM x2
570 block%!12=vwy%+vwh%    :REM y2
580 block%!24=-1:REM no winds above
590 block%!28=&FF00000F:REM wndow flg
600 REM   Window Colours
610 block%?32=7 :REM Title fgnd
620 block%?33=2 :REM Title bcg
630 block%?34=7 :REM Work area colour
640 block%?35=1 :REM Work area bcg
650 block%?36=3 :REM Scroll bar bcg
660 block%?37=1 :REM Scroll bar fgnd
670 block%?38=12:REM Title bar hlght
680 REM   Work Area Extent
690 block%!40=0          :REM WAE x1

```

```

700 block%!44=-vwh%-exty% :REM WAE y1
710 block%!48=vwv%+extx%  :REM WAE x2
720 block%!52=0           :REM WAE y2
730 block%!56=&3D:REM Title icon flags
740 block%!60=3<3<12:REM Work area flgs
750 $(block%+72)="Test Window"
760 SYS "Wimp_CreateWindow",,block% TO
handle%
770 =handle%
780 :
790 DEFPROCredraw
800 block%!0=whandle%
810 SYS "Wimp_RedrawWindow",,block% TO
more%
820 PROCgetorigin(block%,x0%,y0%)
830 WHILE more%
840   PROCdraw(x0%,y0%)
850   SYS "Wimp_GetRectangle",,block%
TO more%
860 ENDWHILE
870 ENDPROC
880 :
890 DEFPROCgetorigin(block%,RETURN x0%
,RETURN y0%)
900 x0%=block%!4-block%!20
910 y0%=block%!16-block%!24
920 ENDPROC
930 :
940 DEFPROCdraw(x0%,y0%)
950 SYS "Wimp_SetColour",11
960 MOVE x0%,y0%-40
970 PRINT TIME$
980 SYS "Wimp_SetColour",10
990 CIRCLE FILL x0%+100,y0%-400,50
1000 ENDPROC
1010 :
1020 DEFPROCclose
1030 $block%="TASK"
1040 SYS "Wimp_CloseDown",task%,!block%
1050 ENDPROC
1060 :
1070 DEFPROCerror
1080 ON ERROR OFF
1090 $block%="TASK"
1100 SYS"Wimp_CloseDown",task%,!block%
1110 PRINT REPORT$;" at line ";ERL
1120 ENDPROC
1130 :
1140 DEFFNwimperror
1150 !block%=ERR
1160 $(block%+4)=REPORT$+" at line "+ST
R$ERL+CHR$0
1170 SYS "Wimp_ReportError",block%,3,"T
est Window" TO ,response%
1180 IF response%=2 THEN PROCclose:=TRU
E ELSE =FALSE

```

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THE SPARK ARCHIVER

David Spencer takes a look at a Desktop archiver and file compressor.

Subscribers to the RISC User magazine disc may recall that in the past we have published two versions of a utility called *Arc* as a bonus item. *Arc* is a command line driven utility which both compresses and bundles together files. Given a set of files, *Arc* will combine them into a single file, the length of which will be less than the combined lengths of the individual files. The main use for which *Arc* is intended is in the downloading of files from bulletin boards and viewdata systems. These typically use archived files, especially with IBM PC programs, both because they take up less room, and also because it is much simpler to download a single file than a group of them. Because *Arc* is designed to cope with several standard archive formats, it is possible to decompress many files with it, though the actual decompressed files may not be of much use if they are for another system. Now, David Pilling who implemented *Arc* on the Archimedes, has followed the RISC OS philosophy and developed a multi-tasking Desktop version called *Spark*.

When *Spark* is installed, it places an icon on the iconbar. Pressing the Menu button over the icon offers Quit and Info options, and a *New archive* option. Selecting this pops up a save box from which to create an empty archive. Archive files are represented by a picture of Noah's Ark. Dragging an archive onto the iconbar icon will open a pseudo directory viewer, and new files can be added to the archive by dragging them into this viewer. Similarly, file are recovered from the archive simply by dragging them out. Menu options allow you to change the archive format, and the archiving method, so that it is possible, for example, to archive only files that are newer than the version already in the archive. Other options allow the archive to be encrypted using a password, and the integrity of the archive checked to see if the files are all readable.

DOCUMENTATION

The 'user guide' comes in the form of a text file on the disc and a short application to

display it. These notes detail how to use *Spark*, and any possible problems. While they are relatively short, they are perfectly adequate for what is a very easy-to-use product.

BONUS ITEMS

Included on the *Spark* disc are a couple of public domain programs. The first of these is the RISC User Dustbin which was originally published on the magazine disc for Volume 2 Issue 6. For readers who haven't seen it, this allows files to be deleted by dragging them into the bin. The second bonus item is a utility to make the Desktop 'sticky'. This allows objects to be dragged out of directory viewers and placed anywhere on the Desktop background. Thereafter, the system will remember where the object came from (and hence actually is), and there is even a facility to save the Desktop so that when it is restarted all the objects are there. While at first sight this appears to be a very useful utility, it suffers from the major drawback that it falls over if the original of any file on the Desktop is deleted, moved or renamed.

CONCLUSION

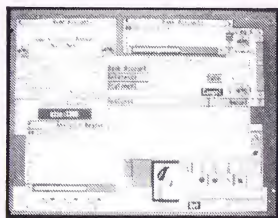
I can see two main reasons why people would use *Spark*. Firstly, for its original purpose of packaging files for transfer via modems, and secondly for compressing files when making an archive, or a backup, of a hard disc. In the first case, *Spark* performs the task with ease. However, although the file compression is very good (in terms of space saved), each archive file has to fit on a single floppy. Therefore, to make a backup of an entire hard disc, it is much simpler to use a dedicated backup utility. Whatever your needs, if you feel that *Spark* would be useful, then you really can't go wrong at under £6.

Product	Spark Archiver
Supplier	David Pilling, PO Box 22, Thornton Cleveleys, Blackpool FY5 1LR.
Price	£5.99 inc. VAT and p&p

RU

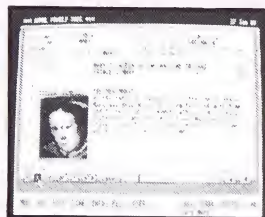
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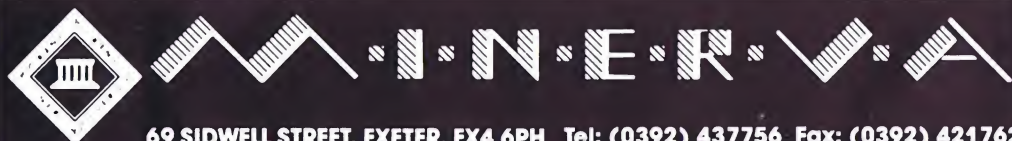
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A POP-UP FILE SELECTOR

Graham Crow presents a Basic function to implement a pop-up file selection box.

Because of space constraints, this program is included on the magazine disc only.

While the RISC OS Desktop provides a consistent and simple-to-use interface for loading and saving files, not everyone will want to write their programs to use the WIMP. However, this doesn't mean that you cannot have a consistent and user-friendly file selector, as this program shows. The basic principle is that whenever a program wishes to access a file, it calls the generalised file selector which allows the user to move between discs, and up and down directories, ultimately selecting a file. The full pathname of this file is then returned to the program, which is free to do whatever it likes with the file.

USING THE PROCEDURE

The file selector function is contained on disc as part of a demonstration program. When this is run you will be presented with a blank screen with the file selector in the centre. This box will be similar to that shown in figure 1. Working round the box: at the top is a title which can be specified by the main program. Below this are two boxes, a small one showing the drive number, and a larger one with the name of the currently displayed directory. To the left of these are two arrows which can be used to step through the available drives. This is done using the pointer and the *Select* button. At the right is an arrow which can be used to move up a level in the directory tree. If you change the disc in the drive, clicking on the drive number window will mount the new drive.

The large area in the centre of the selector shows the entries in the current directory. Files are shown by name, along with their filetype in both hex and as a name. Entries will be greyed out if their filetype doesn't match that specified by the main

program. Sub-directories are shown in red, with a down-arrow to the right of the name. Pressing Tab will change the display to show the access and length of each file, instead of the filetype. A further press of Tab reverts back again. Clicking on a non-grey filename will select it and cause its name to appear in the bottom box, while clicking on a sub-directory will display its contents. Once a file has been selected, the name in the lower box can be edited, and clicking on OK will return the full pathname to the main program. Clicking on CANCEL will return without a name. The demonstration program will merely display the selected filename. If there are more files than can be fitted on the display, then the two arrows to the right of CANCEL will move up and down by a page.



USING THE SELECTOR IN YOUR OWN PROGRAMS

Incorporating the file selector function into your own program is relatively easy. The best way to understand how this is done is to study the demonstration program. You will need to include all the code from line 320 onwards in your own program. The main function is *FNfiler*, but before calling this you must call the initialising procedures, as in line 150. This sets up various variables, and also the colour palette. The function *FNfiler* takes five parameters thus:
`path$=FNfiler(left,top,lines,head$,type)`
The parameters *left* and *top* specify the position of the top left of the window in terms of characters, while *lines* specifies the number of lines to use for the file display. *head\$* is the heading to give to the window, and *type* is the particular filetype that should be recognised. A value of -1 indicates that all file types are valid. The function returns the full pathname of the selected file, or a null string if cancel is selected.

Reviewed by Mike Williams

Art packages have proved a popular commercial offering for the Archimedes, at least from the suppliers' point of view. Minerva has now joined the fray with Atelier, a mode 15 painting package of some sophistication, but readers may be forgiven for wondering whether another such package is really needed.

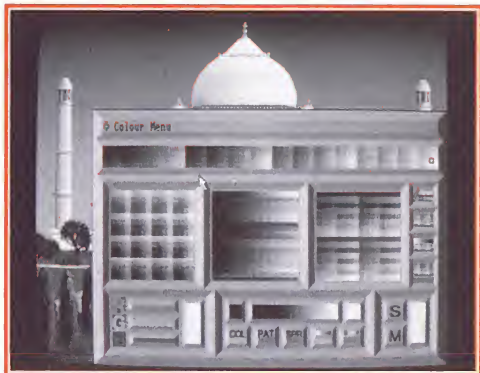
Unlike previous art packages, Atelier has been designed to work from the outset within the RISC OS Desktop environment, but I have to report that otherwise Atelier appears to offer little that is significantly different to that which is already available through such packages as Art Nouveau (reviewed in Volume 2 Issue 5) and ProArtisan (see Volume 2 Issue 3). In this review I shall therefore concentrate on only those features which seem particularly deserving of a mention.

For your money you receive a single 3.5" disc, a 92 page manual and a reference card. This includes a keystrip to be cut out, as well as two labelled screens for use as a reference with *Fill Style* and *Colour Menu*. The packaging follows Minerva's usual style, but more colourful and attractive than has often been the case in the past.

From the Desktop, Atelier is installed on the icon bar. Double clicking on its icon changes the display to a full screen painting area, with a panel showing the Minerva logo and Atelier title which can be removed). From within Atelier, pressing F8 will return you to the Desktop, where you can change memory allocations for fonts and sprites, for example, using the Task Manager. Clicking on the Atelier icon returns you to your current picture with all options set as before.

Atelier is controlled by a hierarchical menu system activated with the Menu button of the mouse. Press Select to choose any menu option, including sub-menus. Moving the pointer outside the menu area causes the menu to disappear instantly. This may

sound undesirable, but as Minerva suggests in the documentation, one soon becomes accustomed to this, and I found the whole menu system, with some practice, easy and efficient to use.



The Atelier Colour Menu

Colour control is quite complex (Minerva would no doubt argue 'quite comprehensive'), and a Colour Menu can be displayed by a second click of the mouse when any other menu is already on the screen. The Colour Menu merits further attention, as with practice I found it to be one of the most important and useful features of Atelier. You can, of course, select any colour from the 256 available. There are also Red/Green/Blue slide bars as an alternative way of choosing colours.

A second panel gives a choice of 16 sets of tints of a single shade, but tints can also be created for other user-generated colours. It is possible too, to reduce the range of tints in a set, and to switch between light to dark or dark to light. It is also possible to set a repeat so that painting can cycle through a range of tints (for example, to paint the leaves of a tree in various shades of green).

The other (third) main panel of the Colour Menu deals with what Minerva calls *Priority*

Colours. When a priority colour (or colours) is in operation, painting only changes the other colours. For example, this can be used so that a new object can be drawn to appear behind an existing object (by making its colour a priority colour). It can also be used to change just one colour into a new one, without affecting the rest of the display. This will also work with a range of tints, either overwriting the tints only, or overwriting everything else only. The Colour Menu takes some mastering, but it is crucial to using Atelier effectively.

The Colour Menu also controls the choice between paint, patterns and sprites when creating pictures. There are separate pattern and sprite editors, and both patterns and sprites can be saved to disc for reloading.

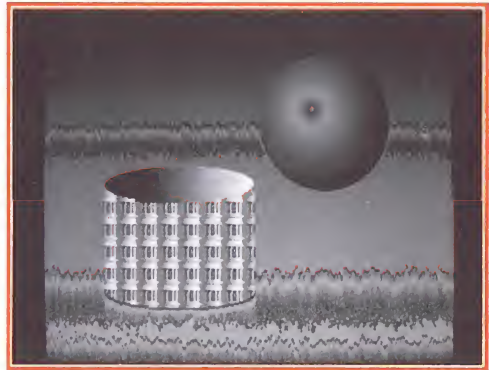


The pattern menu

Atelier contains all the features which we have come to expect from an art package: the ability to draw straight and curved lines and shapes, including three-point curves. Brushes may be in a variety of sizes and shapes, or you can define your own. A spray brush is also available, and all brushes can use paint, patterns or sprites.

Likewise, the Fill option can also work with paint, patterns and sprites, and with a range of tints. A separate Fill Style menu provides various controls, allowing graduated shading in a variety of styles.

The text option uses anti-aliased fonts, but you must allocate sufficient font space, and load the required fonts from the RISC OS Applications Disc 1 first. You then enter the text and create a box of the size and shape you want, and Atelier will automatically scale and position the text. The manual claims that Atelier will also work with the outline fonts (to be available with some DTP packages), but I was unable to test this.



Using different 'fill' styles to create an image

Many other features of Atelier are much as you would expect, and I list the more important below.

- Magnifier and pixel editor
- Define and copy part of picture
- Distort copy over user-defined shape
- Copy and resize part of the picture using anti-aliasing
- Pixellate a picture
- Sprite editor
- Bottle copy to wrap a picture round a three-dimensional object
- Formula copy to create mathematical surfaces
- Sequencer to animate picture sequences
- Use of function keys to 'undo' actions

DOCUMENTATION

The Atelier manual is, by and large, well written and easy to follow. Working through the so-called 'Experimental' section provided an excellent and quite comprehensive introduction to the software. The reference section also reads well, but is not quite as detailed as perhaps it should be. I do have two gripes with the manual. The illustrations appear to have been taken directly from screen displays (this even includes captions and labels), but the rendering of various shades of colour in patterns of dots leads to highly unreadable text. This is important, as the illustrations are often an integral part of an explanation.

Secondly, I disagree (as I am sure will many artists and designers), at the manual's oft assertion that you only need Atelier to become the next Salvador Dali or Renoir of the art world. Any skilled craftsman will tell you that a tool is only as good as the user, and no software package will turn a dullard into an imaginative and highly regarded designer.

CONCLUSIONS

Atelier's competitors are clearly Art Nouveau and ProArtisan. As far as price is concerned, Atelier occupies the middle ground. I quite liked Atelier, and feel sure it would suit many Archimedes users. Art Nouveau is also very good value for money, but with fewer facilities. ProArtisan is the Rolls Royce in this market, and a lot of time and effort has gone into its production.

I have to confess that personally I dislike ProArtisan's highly graphic and often

unintelligible use of icons, although Atelier is not entirely without this failing either. At the end of the day your choice will depend on the answers to two questions: which



A completed picture "Satin"

package will allow you to do the things you want to do, and which best suits your own style of working. I suggest you consider both these points with care.

Given that Atelier will work fully within the Desktop environment (although not completely multi-tasking), that, together with its very full specification, would make it my choice. However, do not dismiss ProArtisan out of hand just because of its price, while Art Nouveau still provides an excellent and easy-to-use introduction to the world of multi-coloured art.

Product	Atelier
Supplier	Minerva Software 69 Sidwell Street, Exeter EX4 6PH. Tel. (0392) 421762
Price	£99.95 inc. VAT and p&p

SYS CALLS EXPLAINED

by Lee Calcraft

The so-called SYS call (or its ARM code equivalent the SWI call) is a special call which gives the user direct access to operating system routines. And although many simple Basic programs make no recourse to SYS calls, there are in fact many operations which cannot be performed without their use. The Wimp is a case in point, being accessed almost exclusively via such calls.

The Archimedes has a potential 16777216 such calls in its repertoire, though only a relatively small number are actually defined. Each SYS or SWI call has an identification number, and if you are in Basic, then each may also be referred to by name. For example the two calls:

```
SYS "OS_WriteC"
```

and `SYS 0`

are equivalent. Their effect is to output a single character to the current VDU stream (normally the screen). The character to be output must be supplied as a parameter. To output the letter "A" for example, you would write:

```
SYS "OS_WriteC", 65
```

since 65 is the ASCII code for "A".

Generally speaking it is always best to supply the SYS name rather than its number, since this makes your code easier to follow. But if you are using the name, it must be entered *exactly* as it appears, right down to the case of each letter. If you entered the SYS name as "Os_WriteC" you would get the error "No such SWI". You should also be careful with the so-called *underscore character* used in all SYS names. This is produced by pressing Shift together with the minus key. Note also the vitally important comma separating the SYS name and the parameter. If you miss this out you will get a syntax error signalled.

In practice almost all SYS calls take one or more parameters. OS_Plot takes 3. For example:

```
SYS "OS_Plot", 4, 100, 200
```

This call would move the graphics cursor to point 100,200 (4 is the plot code for move absolute). In fact the sequence of parameters supplied to SYS calls represents values which will be placed in sequence into ARM registers R0, R1, R2 etc. when the call is executed. Sometimes you will see that one or more parameters have been omitted from a call by placing the separating commas adjacent to

each other. When this happens, the operating system inserts a value of zero in the corresponding ARM register. Thus if we issued the following:

```
SYS "OS_Plot", 4, , 200
```

this would move the graphics cursor to the point 0,200 - the second parameter of the call (the x co-ordinate) being set to zero.

Sometimes when large quantities of information must be passed to a SYS call, a so-called parameter block is used. This happens with most Wimp calls. In such cases, the user builds up a data block in RAM containing the information needed by the SYS call, and then passes the start address of the block as one of the parameters of the call.

SYS calls can also *return* information. "OS_Mouse" for example, returns the pointer co-ordinates, button state and time of button change. It might be used as follows:

```
SYS "OS_Mouse" TO x%,y%,button%,time%
```

Here, as in all cases where no parameters are supplied, the comma after the SYS name may be omitted. After this call, the four variables following the word "TO" will hold the values returned by the call. As with the parameters supplied by the user, the return parameters reflect the contents of ARM registers R0, R1, R2 etc. And again, if a particular register in a sequence is to be ignored, the comma separators can be moved together. Thus:

```
SYS "OS_Mouse" TO , ,button%
```

would still return the button state.

Finally, to illustrate how supplied and return parameters are used together, the following OS_Byte call will read CMOS RAM location n%, and store the result in the variable result%:

```
SYS "OS_Byte" 161,n% TO , ,result%
```

Note the two commas before the variable *result%*, indicating that the value returned in this variable should be the contents of ARM register R2 (R0, and R1 being discarded). To test this out, try it with n%=147. The variable *result%* will return the number of pages of sprite space configured in your machine.

For further details on this topic, see the *Programmer's Reference Manual*, which documents each equivalent SWI call, giving the contents of all relevant ARM registers before and after execution.

RU

ANNOUNCING A MAJOR NEW SOFTWARE RELEASE

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This word processor alone justifies the purchase of Premier. It allows text to be moved between any number of files open at once, searches to be made forwards or backwards using powerful pattern matching, document headers and footers to be defined, has on screen formatting and other features too numerous to list here. The command file defining this may be edited to tailor the features to your own requirements, a feature not found in any other word processor.

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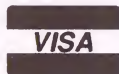
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BRAINSOFT MULTIPLE I/O PODULE UPDATE

by Lee Calcraft

In last month's RISC User I reviewed Brainsoft's new multiple function podule, and found it wanting in a number of respects. Brainsoft have kindly sent me a new board to test. This shows evidence of component changes around the analogue input area of the board.

As far as the video side of things is concerned, the alterations certainly seem to have done the trick. The frame grabber now works properly. The quality of the grabbed image is quite reasonable, though not as crisp as that produced by the much more expensive Watford unit. One particularly noticeable point is that successive grabbed images of the same picture vary in quality. This is a consequence of the hardware, and the only solution is to repeatedly grab a particular image until you are happy with the result.

I also reported that the analogue input gave erratic results when connected to a



Image captured with digitiser

stable resistive source. This problem still occurred on the new board.

On this month's magazine disc we include a frame grabbed by the digitiser from a 260 line resolution VHS c video camera.

RU

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ARM CODE SINGLE STEPPER (continued from page 21)

```

1580 EQU$ "      ":EQU$ 0:ADD R4,R4,#1
1590 TST R4,#3:SWIEQ &10A:SWIEQ &10D
1600 CMP R4,#16:BNE reg2:BL disinst
1610 SWI "OS_WriteS"
1620 EQU$ "Processor is in ":EQU$ 0
1630 AND R0,R3,#3:ADR R1,modes
1640 LDR R0,[R1,R0,LSL #2]
1650 SWI "OS_WriteC":MOV R0,R0,LSR #8
1660 SWI "OS_WriteC":MOV R0,R0,LSR #8
1670 SWI "OS_WriteC":SWI "OS_WriteS"
1680 EQU$ " mode":EQU$ &D0A:EQU$ 0
1690 AND R3,R3,#&FC000000:CMR R3,#0
1700 BNE reg3:SWI "OS_WriteS"
1710 EQU$ "No flags set":EQU$ 0
1720 B regout
1730 .reg3 ADR R1,flags
1740 MOV R2,#6:SWI "OS_WriteS"
1750 EQU$ "Flags set are : ":EQU$ 0
1760 .reg4 LDRB R0,[R1],#1
1770 MOV$ R3,R3,ASL #1
1780 SWICS "OS_WriteC":SUBS R2,R2,#1
1790 BNE reg4
1800 .regout SWI &10A:SWI &10D:B main
1810 :
1820 .modes EQU$ "USR FIQ IRQ SVC "
1830 .flags EQU$ "NZCVIP":ALIGN
1840 .disinst MOV R10,R14
1850 SWI "OS_WriteS"
1860 EQU$ "Next instruction is : "
1870 EQU$ 0:LDR R3,[R12,#15*4]
1880 BIC R0,R3,#&FC000003
1890 ADD R1,R12,#256:MOV R2,#9
1900 SWI "OS_ConvertHex8"
1910 SWI "OS_Write0":SWI &120
1920 BIC R1,R3,#&FC000003
1930 LDR R0,[R1]
1940 SWI "Debugger_Disassemble"
1950 MOV R0,R1:SWI "OS_Write0":SWI &10A
1960 SWI &10D:MOV PC,R10
1970 :
1980 .alter SWI "OS_WriteS":EQU$ &D0A
1990 EQU$ "? ":EQU$ 0:ADD R0,R12,#256
2000 MOV R1,#256:MOV R2,#ASC " "
2010 MOV R3,#&FF:SWI "OS_ReadLine"
2020 BCS escesc:ADD R1,R12,#256
2030 .alter2 LDRB R0,[R1],#1
2040 CMP R0,#ASC " ":BEQ alter2
2050 BCC regout:CMR R0,#ASC"P"
2060 BNE alter3:LDRB R0,[R1],#1
2070 CMR R0,#ASC " ":BNE badalter
2080 MOV R2,#16:B alter4
2090 .alter3 SUB R1,R1,#1:MOV R0,#10
2100 ORR R0,R0,#1<<29:MOV R2,#15
2110 SWI "XOS_ReadUnsigned"
2120 BVS badalter
2130 .alter4 MOV R3,R2:MOV R0,#16
2140 SWI "XOS_ReadUnsigned":CMR R3,#16
2150 BEQ alter5:STR R2,[R12,R3,LSL #2]
2160 B main
2170 .alter5 LDR R0,[R12,#15*4]
2180 MOV R0,R0,ROR #2
2190 AND R0,R0,#&FF000000
2200 MOV R0,R0,ROR #30
2210 BIC R2,R2,#&FC000000:BIC R2,R2,#3
2220 ORR R0,R0,R2:STR R0,[R12,#15*4]
2230 B main
2240 .badalter SWI "OS_WriteS"
2250 EQU$ &D0A:EQU$ "Bad alter":EQU$ 0
2260 B regout
2270 :
2280 .execute SWI &10A:SWI &10D
2290 BL findnext:LDRB R1,[R12,#170]
2300 CMR R1,#1:BEQ execute2
2310 ADR R1,terminate:CMR R0,R1
2320 BEQ execute2:LDR R1,[R12,#172]
2330 CMR R0,R1:LDRRQ R1,[R12,#14*4]
2340 ORREQ R1,R1,#1<<27
2350 STREQ R1,[R12,#14*4]
2360 .execute2 MOVEQ R1,#0
2370 STREQB R1,[R12,#169]
2380 STRNE R0,[R12,#160]
2390 LDRNE R1,[R0]:STRNE R1,[R12,#164]
2400 ADDNE R1,R12,#getback-patch+68
2410 SUBNE R1,R1,R0:SUBNE R1,R1,#8
2420 MOVNE R1,R1,LSR #2
2430 ORRNE R1,R1,#&EA000000
2440 STRNE R1,[R0]:ADRNE R0,backin
2450 STRNE R0,[R12,#return-patch+68]
2460 ADD PC,R12,#68
2470 .backin LDR R0,[R12,#160]
2480 LDR R1,[R12,#164]:STR R1,[R0]
2490 LDR R1,[R12,#15*4]
2500 AND R1,R1,#&FC000003:ORR R1,R1,R0
2510 STR R1,[R12,#15*4]
2520 LDRB R0,[R12,#168]
2530 SUBS R0,R0,#1:BMI main
2540 BNE registers:SWI "OS_NewLine"
2550 BL disinst:B main
2560 :
2570 .findnext MOV R11,R14
2580 LDR R0,[R12,#15*4]
2590 BIC R0,R0,#&FC000003
2600 LDR R1,[R0]:LDR R2,addinst
2610 AND R1,R1,#&F0000000:ORR R1,R1,R2
2620 STR R1,[R12,#256]
2630 LDR R1,jumpback

```



```

2640 STR R1,[R12,#260]
2650 ADR R14,ccdone:MVN R2,#0
2660 LDR R1,[R12,#15*4]:ORR R1,R1,#3
2670 TEQP R1,#0:ADD PC,R12,#256
2680 .ccdone CMP R2,#0:ADDNE R0,R0,#4
2690 MOVNE PC,R11:LDR R1,[R0]
2700 BIC R1,R1,##F0000000:SUB R2,R1,#1
2710 CMP R2,##F0000000:BEQ oswrites
2720 CMP R1,##C0000000:BCS sequential
2730 CMP R1,##A0000000:BCS branch
2740 CMP R1,##80000000:BCS block
2750 CMP R1,##40000000:BCS transfer
2760 CMP R1,##40000000:BCS notmult
2770 AND R2,R1,##90:CMP R2,##90
2780 BEQ sequential
2790 .notmult AND R2,R1,##F000
2800 CMP R2,##F000:BNE sequential
2810 AND R2,R1,##F<<21:CMP R2,##8<<21
2820 BCC dprocess:CMP R2,##12<<21
2830 BCC sequential
2840 .dprocess AND R4,R1,##F0000
2850 MOV R4,R4,LSR #16:AND R5,R1,##F
2860 AND R6,R1,##F00:MOV R6,R6,LSR #8
2870 BIC R1,R1,##F000:BIC R1,R1,##F0000
2880 ORR R1,R1,##10000
2890 ORR R1,R1,##E0000000
2900 TST R1,##1<<25:BNE dprocimm
2910 BIC R1,R1,##F:ORR R1,R1,#2
2920 TST R1,##16:BICNE R1,R1,##F00
2930 ORRNE R1,R1,##300
2940 .dprocimm STR R1,[R12,#256]
2950 LDR R1,jumpback:STR R1,[R12,#260]
2960 LDR R1,[R12,R4,LSL #2]:CMP R4,#15
2970 BICEQ R1,R1,##FC000003
2980 LDR R2,[R12,R5,LSL #2]
2990 LDR R3,[R12,R6,LSL #2]
3000 ADR R14,dprocdone:ADD PC,R12,#256
3010 .dprocdone BIC R0,R0,##FC000003
3020 MOV PC,R11
3030 :
3040 .sequential ADD R0,R0,#4
3050 MOV PC,R11
3060 .oswrites ADD R0,R0,#4
3070 .oswrites2 LDRB R1,[R0],#1
3080 CMP R1,#0:BNE oswrites2
3090 ADD R0,R0,#3:BIC R0,R0,#3
3100 MOV PC,R11
3110 .branch MOV R4,R0:ADD R2,R0,#8
3120 BIC R3,R1,##F0000000
3130 MOV R3,R3,LSL #8
3140 ADD R3,R2,R3,ASR #6
3150 CMP R1,##B0000000:BCC noquestion
3160 SWI "OS_Writes"

3170 EQU$ "Follow branch to ":EQU$ 0
3180 MOV R0,R3:ADD R1,R12,#256
3190 MOV R2,#9:SWI "OS_ConvertHex8"
3200 SWI "OS_Write0":SWI "OS_Writes"
3210 EQU$ " (Y or N) ? ":EQU$ 0
3220 SWI "OS_ReadC":BCC notesc2
3230 MOV R0,##7E:SWI "OS_Byte"
3240 MOV R0,##ASC"N"
3250 .notesc2 BIC R0,R0,##20
3260 CMP R0,##ASC"Y":MOVNE R0,##ASC"N"
3270 SWI "OS_WriteC":MOV R1,R0
3280 SWI "OS_NewLine":CMP R1,##ASC"Y"
3290 MOVNE R0,R4:BNE sequential
3300 .noquestion:MOV R0,R3:MOV PC,R11
3310 .block TST R1,##1<<20
3320 TSTNE R1,##1<<15:BEQ sequential
3330 MOV R2,R1,LSR #16:AND R2,R2,##15
3340 LDR R2,[R12,R2,LSL #2]
3350 TST R1,##1<<23:BNE indexedup
3360 TST R1,##1<<24:SUBNE R2,R2,#4
3370 B getnewpc
3380 .indexedup MOV R3,#0
3390 MOV R4,R1,LSL #17
3400 .regcount MOVS R4,R4,LSL #1
3410 ADC R3,R3,#0:CMP R4,#0
3420 BNE regcount:ADD R2,R2,R3,LSL #2
3430 TST R1,##1<<24:ADDNE R2,R2,#4
3440 .getnewpc LDR R0,[R2]
3450 BIC R0,R0,##FC000003:MOV PC,R11
3460 .transfer TST R1,##1<<20
3470 BEQ sequential:AND R2,R1,##F000
3480 CMP R2,##F000:BNE sequential
3490 AND R4,R1,##F0000
3500 MOV R4,R4,LSR #16:AND R5,R1,##F
3510 BIC R0,R1,##FF000:TST R0,##1<<25
3520 BICNE R0,R0,##F
3530 ORR R0,R0,##E0000000
3540 ORR R0,R0,##10000:ORRNE R0,R0,#2
3550 STR R0,[R12,#256]:LDR R0,jumpback
3560 STR R0,[R12,#260]
3570 ADR R14,transfer2
3580 LDR R1,[R12,R4,LSL #2]
3590 CMP R4,##15
3600 BICEQ R1,R1,##FC000003
3610 LDR R2,[R12,R5,LSL #2]:CMP R5,##15
3620 BICEQ R2,R2,##FC000003
3630 ADD PC,R12,#256
3640 .transfer2 BIC R0,R0,##FC000003
3650 MOV PC,R11
3660 .addinst ADDEQS R2,R2,#1
3670 .jumpback MOV PC,R14:]NEXT
3680 SYS "OS_File",10,"Sstep",##FFA,,cod
e,0%

```

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RISC OS COMPANION

Reviewed by David Spencer

RISC OS Companion Volume 1 is the first product from Software Solutions, a new company which aims to produce fully legal RISC OS software. So has their first offering lived up to that claim? The Companion is really a set of small RISC OS Desktop applications designed to perform a variety of tasks. Before any of the utilities can be used, you need to make a working copy of the disc and merge the *!System* directory from the companion disc with the equivalent directory from Applications Disc 1. This is because all the programs have been compiled using ABC2 (see RISC User Volume 2 Issue 8), and therefore need the runtime library in the *!System* directory.

THE UTILITIES

A large number of the utilities are for converting text files. There are programs to convert from Edit; Wordwise Plus and View into 1st Word Plus; from Wordwise Plus and View into Edit, and from Edit into 1st Word Plus. These all sit on the iconbar and you simply drag files onto them, and then drag the converted file to a directory viewer. Wherever possible, the conversions maintain highlights and formatting within the text.

There are four utilities which I would class as being system related. The first of these is a filetype converter which will change the filetype of any file dragged onto it to a specified type. Then there is a utility to set up the copy options used by the Desktop. This can be quite useful, particularly as the Desktop will not, by default, overwrite existing files. Of course, all these options can be set up using *SET. *TheBin* is a dustbin similar to the one published on the RISC User magazine disc. However, it has the disadvantage that files are deleted immediately, and cannot be dragged out again. *StarComms* must surely be the most useless of the utilities. It allows a number of star commands to be issued, though I am sure that most users would find it much easier to press F12 and type the command directly.

Three of the most useful commands are *StartUp*, *Cache*, and *GenBoot*. The first of these will set up a *!Boot* file so that autobooting will enter the Desktop with your particular choice of applications installed, and directory viewers open. *Cache* builds up a list of files and their corresponding

applications, so that a file can be run before its application has been 'seen', while *GenBoot* is a utility to simplify the process of transferring Arthur applications to RISC OS. The final two utilities are a note-taking facility for *Edit*, and a very simple teletype terminal which could be used with a modem for logging on to Telecom Gold and the like.

RISCWARE

Riscware is a new term coined to mean software that follows the standards and style of applications such as *Edit*. The Companion claims to be Riscware, and indeed at first sight it does appear so. However, there are a few discrepancies. For example, Acorn state that if you wish to close a file-save box without performing a save, then you should do this by pressing Escape. With the Companion, though, this is done using a quit icon on the save box. Whatever the merits of either approach, the consistency which Acorn has tried to lay down is lost. Similarly, there are a number of dialogue boxes in which options are set by clicking on an 'OK' button, but can be left unset by clicking on the window's close icon. I would much rather have seen a 'CANCEL' button, as it is then immediately obvious what the exact effect is going to be.

Worst of all, when I tried to drag a directory into one of the file converters, rather than complaining nicely, it splatted a text error across the screen and hung up with the hourglass on. Very friendly for a new user!

CONCLUSION

This is the sort of product that users will buy for just one or two of the utilities, but at the high cost of the Companion, I suspect that purchasers will be few in number. However, it is nice to see the appearance of Desktop utilities, and I am sure that this will not be the only such product to be released. However, most of the utilities will be of use to some people, and it is nice to see Riscware products appearing.

Product Supplier	RISC OS Companion Volume 1 Software Solutions, Broadway House, 149-151 St Neots Road, Hardwick, Cambridge CB3 7QJ. Tel. (0954) 211760
Price	£57.45 inc. VAT

RU

TWO 40 MBYTE HARD DISCS

Reviewed by Lee Calcraff

Since we reviewed the Acorn and Watford 20Mbyte hard disc upgrades for the A310 a couple of months ago, a number of faster, larger capacity drives have become available for the Archimedes. In this review we will take a look at two of these units.

The drives selected for the review are a Toshiba 40Mbyte unit with an access time of 25 msecs, supplied by Technomatic, and a 35 msec Fujitsu drive of similar capacity marketed by GES Computer supplies. Both drives come with cables and full fitting instructions. For the purposes of the review, we used an Archimedes 410/1. These new machines

have a built-in hard disc interface with a drive indicator LED already installed. Either drive is easily fitted inside the computer, and plugs directly into the sockets on the main board.

The drives would equally well suit an A310, however, providing a hard disc expansion card is fitted to the backplane. Both Watford and Acorn supply suitable cards for their drives.

Fitting the drives was a relatively easy matter. The outer casings of both have holes matching those on the disc drive fixing bar at the front of the computer, though you need to take care not to strip the thread from the small self-tapping screws (Acorn - please thread the fixing holes on the disc drive mounting bar!). In the case of the Fujitsu unit (but not of the Toshiba), one of the fixing flanges was

offset so as to avoid having to share a fixing hole with the floppy drive.

A further small negative point about the Toshiba drive is that the mounting frame must be unscrewed in order to plug in the

Arc's power supply feed to the drive. This is a little awkward, since it means that you have to screw it all back together again while it is connected to the relatively short power lead within the computer. But this is not really a problem, and both drives were easily installed.



Fujitsu 40 Mbyte hard disc from GES with 3.5" floppy to indicate size

Once your hard disc has been physically installed in the computer, you must

tell the machine of its existence by typing:

*Configure HardDiscs 1

And of course, before use, the drives must be formatted (though GES will supply their drives formatted if you request it). To format a new drive, insert the RISC OS Support Disc (supplied with RISC OS upgrade kits and with the 400/1 series machines) into your floppy drive, and from the Desktop open up the Acorn directory, and run the file:

Hform

This goes through a dialogue process, and you can make use of the information supplied with either of the drives to answer the questions set. All hard discs will carry defective sectors, and with both the drives supplied, these were indicated on a sheet fixed to the body of the drive. When formatting the disc, you can either inform the formatter of the positions of the defects,

as supplied, or you can use the "soak test" option (selectable from Hform). In the latter case, the formatter formats the drive, ignoring defects, and then perpetually checks the disc for read/write errors. GES suggest that you leave this running for 12 hours.

When you finally press the space bar to terminate the soak test, the formatter very quickly writes the map using the information gathered during the soak test; and the formatting process is complete. It then only remains for you to organise a sensible directory structure, and to transfer all your most-used files from floppy disc.

COMPARING THE TWO DRIVES

Both drives gave a similar speed performance on the tests carried out (see table 1). The timings for the standard 20Mbyte Acorn drive are given for comparison, and as you can see, the new drives are significantly faster.

TEST	Acorn	Techno- matic Toshiba	GES Fujitsu
ScreenSave (80K)	0.52	0.35	0.34
ScreenLoad (80K)	0.33	0.25	0.24
*Save (80K)	0.43	0.29	0.25
*Load (80K)	0.34	0.23	0.21
PCW Store Benchmark	1.43	0.82	0.71

Table 1. Hard disc benchmarks - all timings are in seconds

remember to issue the command *BYE before switching off.

As far as noise is concerned, the Fujitsu drive appears a little quieter than the Toshiba. The former generates about as much noise as the Arc's internal fan. Both units are built to a high standard, though the Fujitsu casing perhaps has a slight edge over its rival.

Both drives behaved very reliably over a period of several weeks' intensive use. And that leaves only the price. The Fujitsu drive is a little dearer than the Toshiba, and the auto-parking facility may further sway you in the direction of the latter. But if on the other hand you are keen on keeping noise levels as low as possible, then the Fujitsu may be for you.

```

HARD DISC FORMATTER (V1.72)
Format which drive (4 or 5)? 4
The shape written on the disc matches that of a 20Mb Western Digital/Tandon disc
Do you wish to retain this shape (Y/N)? Y
Old or New map format (O/N)? N
Sectors per track 132
Heads 14
Cylinders 7615
Low current cylinder 71823
Precompensation cylinder 71823
Parking cylinder 7663
Current Defects (Cylinder,Head,Sector)
(20,3,3)
R: no more changes
A: add defect by cylinder, head, byte/sector
C: add defect by disc address
D: remove defect
?
Do you want to soak test the hard disc for defects (Y/N)? N
Are you certain you want to format drive 4 (Y/N)? Y
  
```

Formatting a hard disc with Hform

One feature that I particularly like in the Toshiba unit is its auto-parking facility. As soon as the power is switched off, the heads park automatically, and there is no need to

Product	Toshiba 40Mbyte Hard Disc
Supplier	Technomatic Ltd. Techno House, 468 Church Lane, London, NW9 8TQ. Tel. 01 205 9558
Price	£410.55 inc. carriage & VAT

Product	Fujitsu 40Mbyte Hard Disc
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Into the ARC

This month Mike Williams looks at the provision for looping and branching in Basic V.

Readers of RISC User may recall that in the first article in this series (Volume 2 Issue 7) I presented an overview of the whole process of writing a program. That process, to be successful, depends upon creating a clear structure for your program. In turn this means making frequent use of functions and procedures, the subject of last month's article. It also requires a good understanding of the branching and looping constructs provided on the Archimedes by Basic V.

The idea that a program can be written so that a certain section of code is repeated (a loop), or that a program can be made to choose between two or more different routes through the program (branching) is fundamental to the whole concept of programming (and indeed was first formalised by one of the founders of modern computing, von Neuman, in 1947).

LOOPS

The simplest form of loop can be set up using a GOTO statement to refer to a previous line in a program, but as I have said before, GOTOs do not lead to clear programs, and on the whole are to be avoided when possible. For example, it is only when you reach such a GOTO in a program that you realise that the preceding coding forms part of a loop anyway, as there is nothing which explicitly indicates where the loop begins.

Basic, on all computers, provides an obvious looping mechanism in the form of the FOR-NEXT statement, which is ideal when we want to repeat a group of instructions a 'known' number of times. This uses any variable of our choice to count the number of times the instructions are to be repeated. In its simplest form we might, as an example, write:

```
FOR m = 1 TO month
  READ month$
NEXT m
DATA January, February, March . . .
```

where the value of *month* determines one of the months in the year whose name we wish to read from a set of DATA statements. The variable *m* simply counts from 1 (the starting value) up to the value of *month*. A FOR-

NEXT loop always begins with the keyword FOR and terminates with the keyword NEXT, so it is always easy to recognise such a loop in any program, and you will find many examples to study in the programs listed in RISC User.

By default, FOR-NEXT loops always count upwards in steps of 1, but you can count both up and down in whatever step size you wish by specifying this with the keyword STEP. For example:

```
FOR x = 40 TO 1240 STEP 100
  LINE x,0,x,1024
NEXT x
```

would draw a series of vertical lines (in the current graphics colour) at intervals of 100 graphics units across the screen.

A few comments at this stage may not go amiss. If the loop counts upwards the starting value should be smaller than (or equal to) the final value; for counting downwards the reverse should be true. Loops can be nested one within another, but must not overlap. And never put the NEXT into any form of conditional statement (IF-THEN-ELSE) - even if you get it to work it is bad practice, and any later changes can cause no end of trouble.

There is also a particular problem with the implementation in BBC Basic (though this does not necessarily apply in all versions of Basic). Consider the following example:

```
100 PRINT"Times to toss a coin";
110 INPUT n
120 heads=0:tails=0
130 FOR toss=1 TO n
140 value=RND(2)
150 IF value=1 THEN heads=heads+1 ELSE
tails=tails+1
160 NEXT toss
170 PRINT"Heads ";heads;" tails ";tails
180 END
```

This is designed to count the number of times *heads* or *tails* will appear in tossing a coin. Lines 140/150 will randomly assign either 1 or 2 to *value* each time the loop is repeated.

Now logically, we would expect that if the answer to the initial question (and hence the

Into the ARC

value of *n*) happened to be given as 0, then the loop would not be executed at all. In fact, it will still be executed once, giving an incorrect result. A FOR-NEXT loop will always be executed at least once, even if the starting and terminating values suggest that this is wrong. This is something you need to be aware of whenever you use the FOR-NEXT construction.

However, Basic V provides two further ways of controlling loops which behave more logically. These alternatives also control loops in a fundamentally different way. FOR-NEXT should be used only when the number of repetitions is known at the start of execution of the loop. The alternative is to repeat a section of the program until some condition is satisfied. For example, we may wish to search (or read) through a list of names until a particular name is found. We don't know where in the list the required name might be so we cannot count through the names to find it.

The two alternatives (in BBC Basic) are REPEAT-UNTIL and WHILE-ENDWHILE. The former will repeat a group of instructions until some condition is satisfied, but note the order - *perform* the task *until* complete. Many programs consist of a main loop which is repeated until the user decides to exit from the program, and this is often expressed as a REPEAT-UNTIL loop:

```
exit%=FALSE
REPEAT
  PROCdisplay_menu
  option%=FNselect_option
  PROCexecute(option%)
UNTIL exit%
```

This outline program uses a variable *exit%* to act as a *flag* in the program. Initially the flag is set to be FALSE. The main loop is presumed to display a menu on the screen from which the user makes a choice, and the program then performs the selected task. It assumes that one of the menu choices is an exit from the program which if selected causes *exit%* to be set to TRUE. When this happens the program exits from the REPEAT-UNTIL loop because the terminating condition has been satisfied. Again, you will find many of the programs which we publish contain examples of this

structure, presented in outline above (using procedure calls).

There are many situations in most programs where a REPEAT-UNTIL form of loop is the natural choice, whether as a major feature, or as minor component. Here is a simple example of a REPEAT-UNTIL loop which is used quite commonly in many programs:

```
REPEAT
  G$=CHR$(GET AND &DF)
UNTIL G$="Y" OR G$="N"
```

The loop is repeated until either 'Y' or 'N' is pressed (GET AND &DF converts any lower case letters to upper case before testing). This can be extended into a useful little function:

```
1000 DEF FNask(text$)
1010 LOCAL G$
1020 PRINT text$+"?";
1030 REPEAT
1040 G$=CHR$(GET AND &DF)
1050 UNTIL G$="Y" OR G$="N"
1060 =(G$="Y")
```

This will display any message supplied as the parameter of the function, and return the value TRUE if the answer is 'Y' (for yes) or FALSE if 'N' (for no). For example, you might put in a game:

```
100 PROCstart
110 REPEAT
120 PROCplay_game
130 UNTIL FNask("Finish game")
140 END
```

However, note that the terminating condition is only tested *after* the body of the loop has been performed at least once. Thus a REPEAT-UNTIL loop suffers the same restriction in this respect as does a FOR-NEXT loop.

This is not so with the other form of conditional loop, the WHILE-ENDWHILE construction. Because this form of loop is less well known, it is worth defining its syntax a little more carefully than we have done hitherto. It takes the form:

```
WHILE <condition>
  <statement(s)>
ENDWHILE
```

As long as the specified condition remains true, the body of the loop will continue to be executed. If the condition is not satisfied at

all, the following action will never take place. For example, we might write:

```
xpos=640: ypos=512
WHILE (xpos>x1 AND xpos<x2) AND
(ypos>y1 AND ypos<y2)
  PROCmove (xpos, ypos)
  MOUSE xpos, ypos, state
ENDWHILE
```

This will allow the mouse to move a pointer on the screen for as long as the pointer position remains between the bounds set by x1 and x2, and y1 and y2.

A good programmer will be conversant with all the methods in Basic by which a loop may be constructed, and be able to select the one which is most appropriate (most natural) in any given instance.

BRANCHING

The same should also be true when it comes to branching, at its simplest in the form of the IF-THEN statement. Again, this is a standard feature of all Basics, but if you are new to BBC Basic, then you need to familiarise yourself with its precise syntax in more complex examples. First of all, here is a simple instance of its use:

```
IF option=1 THEN PROCmove_left
If the condition is true then execute the following statement(s) - a procedure call in the example. Several statements, separated by colons, can follow the THEN in which case all will be executed if the condition is true. Thus, for example:
```

```
IF option=1 THEN PROCcalc:PROCredraw:
count+=1: flag=TRUE
```

If you look at other people's programs you will find many instances where the keyword THEN has been omitted. This normally causes no problems in practice, and whether to include THEN or not is largely a matter of personal style.

In the above examples no action occurs (or is specified) if the condition fails. This can be included using an ELSE clause, for example:

```
IF option$="plus" THEN PROCincrease
ELSE PROCdecrease
```

The statements following the THEN or the ELSE can also include further IF-THEN or IF-THEN-ELSE statements, but it is often difficult to be sure of the logic of such constructions. Generally speaking, you should encounter few

problems with ELSE IF, but try to avoid THEN IF. In outline, you should find that:

```
IF <condition> THEN <statements> ELSE
  IF condition THEN <statements> ELSE
    IF condition THEN <statements> . .
```

will work as expected.

Any problems that may occur can be avoided in Basic V by using a special *block-structured IF-THEN*. This takes the form:

```
IF <condition> THEN
  <statements>
ELSE
  <statements>
ENDIF
```

The 'statements' may include other IF-THEN-ELSE-ENDIF constructions, but no ambiguities will occur.

Here is an example of the use of this form of IF laid out to show its structure (LISTO7 will do this for you automatically).

```
IF FNfin_record(n%) THEN
  PROCread_record(n%)
  PROCdisplay_record(n%)
  IF FNupdate_record(n%) THEN
    PROCinput_data
    PROCwrite_record(n%)
  ENDIF
ELSE
  PROCdisplay("Record not found")
ENDIF
```

The coding attempts to locate and possibly update a record in a data file, using clearly named procedure or function calls to do all the detailed work. There is one main IF-THEN-ELSE-ENDIF with another IF-THEN-ENDIF nested inside.

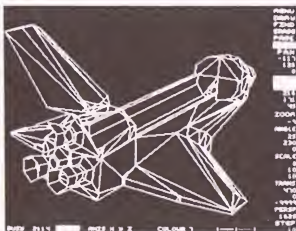
There is one important form of branching in Basic V which I have not covered this time, and that is the all-important CASE statement which handles multiple branching (although this can be achieved with nested IF-THEN-ELSE statements). This I hope to cover at some point in the future.

In conclusion, if you are to make the most of BBC Basic then it is important to be familiar with all the possible forms of looping and branching. If some of these are new to you then I suggest you deliberately try to include them in the next program which you write.

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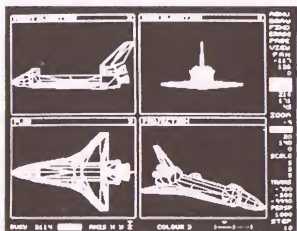
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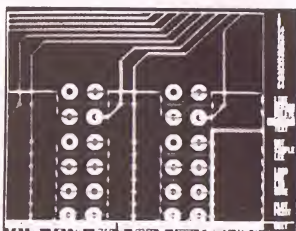
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The RISC OS Programmer's Reference Manual

David Spencer previews Acorn's definitive reference guide to RISC OS.

Acorn has just released the final draft of the RISC OS Programmer's Reference Manual. The pre-release version we have has inconsistent page numbering and a lack of full indexes, but apart from that is identical to the final version which will be on sale shortly.

The new PRM is a massive four volumes, each one being around 500 pages in length. This makes it over three times as long as the existing PRM. Rather than repeating the indexes four times, these have been separated into their own volume. As well as a conventional subject index, there are also indexes for star commands, OS Byte and OS Word calls, and SWIs (both by number and name).

CONTENT

The manual is split into five major sections, plus a set of appendices and tables. The first section is referred to as an introduction, but is in fact much more than that. It is in this section that all the fundamentals of RISC OS are explained, including the basis of SWI calls, star commands, OS Byte and OS Word, interrupts, events, errors, buffers and vectors. Also in this section is a brief description of the Archimedes hardware.

The second section covers the RISC OS kernel which consists of all the central features that are not dealt with separately. Among these are the VDU drivers, character input and output, relocatable modules and memory management.

The third section is devoted entirely to the subject of filing systems. This handles the individual filing systems as well as the FileSwitch and FileCore modules which are central to all filing systems. The fourth section explains in detail the Window Manager, and therefore also includes the material relating to the writing of multi-tasking applications. The final section is entitled 'System Extensions', and deals with all the leftovers. For example, the Font Manager and sound system feature here.

The appendices cover ARM assembler, the linker, file formats, and various topics

related to interfacing with compiled languages. The manual is rounded off with tables of VDU codes, screen modes, file types and character sets.

Obviously with a manual that is three times the length of the existing PRM, you would expect it to contain much more material, and this is indeed the case. Much of this is totally new information that arises as a result of the new features of RISC OS. On the other hand, though, many areas which are largely unchanged from Arthur are now documented in greater detail, including sections on some previously uncovered subjects. For example, there is now a large chapter on Expansion Cards (Podules) which explains the basis of writing a podule as well as detailing the available commands. The existing PRM has just two pages on the subject.

Another idiosyncrasy of the new PRM is the chapter on the Font Manager. Rather than documenting the Font Manager supplied with RISC OS, it instead deals with the new Outline Font Manager which is currently only available with the Acorn DTP package.

STYLE AND PRESENTATION

The new PRM is in the standard 2/3rd A4 size adopted by Acorn, and each page has a line down the left margin, with sub-headings in the margin. This layout is very similar to that of the other RISC OS guides. The material content, and its layout, has been rationalised when compared with the original PRM. Each major section is split into a number of chapters, each of which covers an individual topic (for example character output or relocatable modules).

Each chapter starts off with an introduction which lists what is covered in that chapter, followed by an overview which explains the principles of the particular RISC OS feature dealt with by that chapter. Next is a section of 'technical details', which covers the material in more detail. This is followed by the explanations of star commands, SWI calls etc, with an uncluttered one per page layout. Some chapters also contain

application notes to explain particular methods and techniques.

One thing which I'm sure many people will find a little strange is that the new PRM is for RISC OS, while the old one was specifically for the Archimedes. This means that throughout the manual an abstract RISC OS based computer is referred to, rather than the Archimedes. Presumably this is so that the material is also of relevance to the R140 UNIX workstation.

CONCLUSION

The RISC OS PRM is one of those books that if you need it, you have to buy. There are no alternatives, and hence you have to live with any failings. Thankfully, though, I can say that there are few of these, and the PRM is a great improvement on the original, both in terms of content and presentation. However, it must be remembered that this is a reference work, and many people will find it hard going.

I am sure that many people who have already bought the existing PRM are going to begrudge having to pay for another manual, especially when it will cost more than the actual RISC OS upgrade. All I can say is that this is the cost of progress, and if you want to use the new features of RISC OS then you will have to buy the new PRM. If you are not convinced, then you might like to consider that a similar set of manuals for the £400 Atari ST will set you back around £200.

People who have not already bought the existing PRM must decide whether they have a need for such a manual. As it stands, the Welcome Guide and User Guide supplied with RISC OS are very much aimed at the user rather than the programmer. Even the optional BBC Basic Guide only covers the Basic language, and not the operating system features. Therefore, if you want to do any serious programming (and by that I mean anything more than a few lines of Basic), then the RISC OS Programmer's Reference Manual is a must.

The RISC OS Programmer's Reference Manual is due to be launched in the autumn at a price of around £79.00.

RU

Emerald Publishing

Acorn dtp



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by

Anne Rooney

The advanced user guide helps you get the most from Acorn DTP. With full operating instructions, hints and tips, style guidelines, instructions on creating a wide variety of documents, and on how to exploit its powerful features to the full, this book leads you through ownership of Acorn DTP from installation to becoming an expert user. It goes far beyond the official User Guide.

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FORMATTER UPDATE

By Glynn Clements

Last month's Formatter program fails to report certain disc errors on the verify option. The following changes should be made to the listed program to correct this, but note that the magazine disc for July/August contains the updated version of this program.

Add the line:

```
1760 IF ((!errorp% AND &FFFFFF)=&0108
C7) AND (format$="E") AND (NOT verify%)
THEN
```

Delete line 1770.

Add the line:

```
1830 SYS "OS_GenerateError",errorp%
```

Finally, add the following lines:

```
1231 SYS"ADFS_DescribeDisc",STR$(driv
e%),rec%
1232 IF rec%!16=655360 THEN
1233 format$="L"
```

```
1234 ELSE
1235 IF rec%?5=0 THEN format$="D" ELS
E format$="E"
1236 ENDIF
```

Unfortunately, the problem was discovered too late to incorporate the necessary changes in the magazine version of this program.

RU

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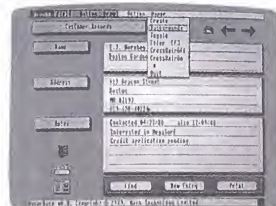
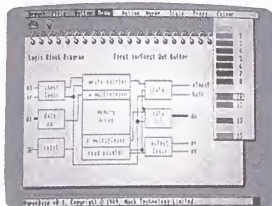
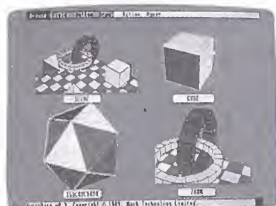
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Transferring Data Files Between Software Packages

By Richard Kirby

Transferring data between different software packages is a fundamental requirement, but unfortunately it is one that is overlooked by a great many software houses. For example see our review of Minerva's Ancestry in RISC User Volume 2 Issue 8 where a special routine had to be written to import data. In an ideal world all packages would provide routines that allow data import and data export in commonly used formats.

Comma Separated Value (CSV) format is probably the most common format for data transfer. In CSV format each piece of data is separated from the next by a comma.

As an example let us examine the transfer of data from BEEBUG's own Masterfile package to Logistix. Masterfile has no CSV export facility, whereas Logistix has a CSV import facility.

MASTERFILE TO LOGISTIX TRANSFER

Logistix is one of the best integrated business software packages available for the Archimedes. It combines the elements of a spreadsheet, timesheet, database and graphics package. Its weakness, however, for Archimedes owners having upgraded from an older Acorn machine, is that their database information from BBC programs cannot be used directly in it. This is a great pity because Logistix is designed to manipulate database information in many varied ways. The program presented here takes files from the BEEBUG's Masterfile database and converts them to CSV format for loading into Logistix. They can be kept in the Logistix database permanently or, if preferred, transported from Masterfile simply to be manipulated in the spreadsheet, graphics and time sheet areas of Logistix.

Masterfile's data format is described in its manual, and can be found dynamically from the "Descriptor" file. In the program, the procedure PROCgetdescriptor reads the field and record characteristics. Matters are kept simple, as all Masterfile data is held as strings. You should be aware that Masterfile fields can contain commas and quotes within

them, and these must be removed (or in this case converted to a '\') before conversion to CSV format.

The program is relatively short and is very simple to use. Type it in, save it to disc and then run it in the normal way. The screen will clear and you will be prompted for the Masterfile data path. Simply press Return to accept the displayed default, otherwise enter the required pathname. After you have entered this information, you will be prompted to insert the Masterfile disc, and then conversion will commence.

The transferred indicator on the screen shows the record number being transferred. When this is complete, the new file will then be copied into the Logistix directory of your Logistix disc, and a message appears, instructing you to boot up the Logistix disc and type the commands to load a new file. These commands are as follows:

/L	-	to select load
C	-	to load a CSV format file
<name>	-	the name of the database file
R	-	load the file into rows

The file will then load and the database will be displayed. When saving the database, the usual 'Logistix' format option can be used.

HOW IT WORKS

Logistix has an option to load CSV format files. The program given here makes the Comma, Carriage Return, and Line Feed insertions automatically. Because commas are used to separate fields, and quotes within strings would upset the format, any existing commas and quotes in the data are automatically changed to back-slash characters so that they do not upset the converted database format. If your requirement is for a different character, then alter the character to replace the comma and quote by amending the back-slash in line 680.

Hopefully, you will find that the techniques used in the program can be extended to allow CSV files to be created from packages that do not have this facility.


```

10 REM          >MFtoLGX
20 REM Program   Masterfile-Logistix
30 REM Version   A 1.04
40 REM Author    Richard Kirby
50 REM RISC User  September 1989
60 REM Program   Subject to Copyright
70 :
80 MODE 12
90 ON ERROR GOTO 960
100 DIM fname$(18)
110 PRINT"MASTERFILE TO LOGISTIX CONVE
RSION" 'STRING$(33,"=")
120 VDU28,0,31,79,3
130 REPEAT:name$=FNresponse("Name of f
ile",""):UNTIL name$>""
140 path$=FNresponse("Masterfile path
name",".0.$MFdata")
150 Ldrive$=FNresponse("Data drive for
Logistix CSV data","0")
160 CLS:OFF:PRINT"Press space when Mas
terfile disc ready"
170 REPEAT UNTIL GET=32:CLS
180 :
190 PROCgetdescriptor
200 mf=OPENUP(path$+".Masters."+name$)
210 lgx=OPENOUT(":"+Ldrive$+"."+name$.log
istix."+name$)
220 PROCwriteheadings
230 :
240 FOR rec=1 TO lastrec%
250 PTR#mf=rec*reclen%+1
260 PRINTTAB(0,0);"Transferred: ";INT(
(rec/lastrec%)*100);"% "
270 FOR f=1 TO fields%
280 INPUT#mf,field$
290 PROCout(FNstrip(field$),f=fields%)
300 NEXT f
310 PROCcr
320 NEXT rec
330 CLOSE#0
340 ON
350 CLS
360 PRINT"Now 'Boot' up logistix disc
and type: /LC"+name$+"<return>R"
370 PRINT"Then save the data in the no
rmal fashion."
380 VDU26:PRINT'''
390 END
400 :
410 DEFPROCgetdescriptor
420 LOCAL X,f
430 LOCAL ERROR
440 X=OPENUP(path$+".Descriptor."+name
$)
450 INPUT#X,fields%,lastrec%
460 reclen%=0
470 FOR f=1 TO fields%
480 INPUT#X,f$type$,flen,fname$(f)
490 reclen%=reclen%+flen+2
500 NEXT f
510 CLOSE#X
520 ON ERROR LOCAL *CDIR $.Logistix
530 *DIR $.Logistix
540 *DIR $
550 ENDPROC
560 :
570 DEFFNstrip(f$)
580 LOCAL i:i=1
590 WHILE MID$(f$,i,1)=" " AND i<LENf$
600 i+=1:ENDWHILE
610 =MID$(f$,i)
620 :
630 DEFPROCout(T$,last)
640 LOCAL c$,i
650 FOR i=1 TO LENT$
660 c$=MID$(T$,i,1)
670 REM Replace commas and quotes (CHR
$34) in fields by \ character
680 IF c$="," OR c$=CHR$34 c$="\\"
690 BPUT#lgx,ASCc$
700 NEXT
710 IF NOT last BPUT#lgx,ASC","
720 ENDPROC
730 :
740 DEFFNresponse(q$,a$)
750 PRINTCHR$12;q$;">";a$'''<return>
for no change."
760 OFF:G=GET:ON
770 IF G=13 THEN =a$
780 REM Line 800 puts key pressed
790 REM back into keyboard buffer
800 SYS "OS_Byte",138,0,G
810 PRINTTAB(LENq$+1,0);SPC(80)
820 INPUTTAB(LENq$,0);">"oa$
830 IF oa$<>"" THEN a$=oa$
840 =a$
850 :
860 DEFPROCwriteheadings
870 FOR f=1 TO fields%
880 PROCout(fname$(f),f=fields%)
890 NEXT:PROCcr
900 ENDPROC
910 :
920 DEFPROCcr
930 BPUT#lgx,13:BPUT#lgx,10
940 ENDPROC
950 :
960 CLOSE#0:ON:VDU26
970 PRINTTAB(0,15);:REPORT
980 PRINT" @ line ";ERL

```

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TECHNICAL QUERIES

PRINTING PROBLEMS AND SPRITE SIZES

Dear RISC User,

In response to your request for ideas for articles and programs, can I suggest that you cover configuring the RISC OS printer drivers. I have a Hewlett-Packard Deskjet, but I am restricted to using it in Epson emulation mode because Acorn do not offer a printer driver for the Deskjet.

Also, in the article 'Creating RISC OS Application Directories' in Volume 2 Issue 4, you state that the sprites used to represent files should be 68 by 68 graphics units. I have discovered that this is much too big, with a size of 42 by 17 pixels being the maximum.

Nobilangelo Ceramalus (New Zealand)

A RISC OS printer driver is an application which provides a unified view of the printer to other pieces of software. This means that any RISC OS application can print its output using just a single print routine. It is up to the printer driver to interface this output to the actual printer. RISC OS is supplied with two printer drivers, one for Epson compatibles, and the other for PostScript laser printers. Both of these can be found on Applications disc 1. Unfortunately, each printer driver is specially written for a particular printer, and it is not possible to re-configure them for other printers. However, it is possible that Acorn, or a third party, will bring out a driver for the HP DeskJet, and in the meantime, Acorn's new DTP package contains a driver for the HP LaserJet, and this may work with your printer.

On your second point, you seem to have confused the terminology. The article stated that the sprites should be defined to be 68 by 68 graphics units in mode 12. In this mode, there are two *graphics units* per pixel horizontally, and four vertically. Therefore, 68 by 68 graphics units corresponds to 34 by 17 pixels. Hence, the height is as you have discovered, and the width that you have suggested is in fact too wide.

David Spencer

CHOOSING AN ARCHIMEDES

Dear Sir,

I joined RISC User because I intended to purchase a 310. But just before I did, the new ranges were announced. Could you advise on the relative merits of the new machines in the middle of the price range.

K.R.Chester

It sounds as if you are thinking of buying a 410/1 or 420/1. Of these two, I consider the 410/1 to be the best buy. The beauty of this machine is that it is expandable right up to the spec of the 440. It contains 1Mbyte of RAM, and you can add a further 1Mbyte to take it towards the spec of the 420/1, and then a further 2Mbytes to upgrade it to a full 4Mbytes. You may not feel that you need more than 1Mbyte of RAM at the moment, but when multi-tasking with RISC OS, 1Mbyte is really a bare minimum, and will be insufficient for certain applications such as desktop publishing.

The 410 does not have a hard disc, but it has a full hard disc interface built in. This means that all you need is a bare drive, and these are very reasonably priced. With the 420/1 you get 2Mbytes of RAM and a 20Mbyte hard disc. But you can now purchase faster 40Mbyte drives for a similar price difference (taking the price of the RAM upgrade into account).

So if you were thinking of buying a 400 series machine, I would recommend the 410. And if you need more RAM, then note that the RAM is *definitely* a dealer-only upgrade. The new RAM chips in the 400 series are mounted vertically, and their pins are very very easily bent. A hard drive, though is much easier to fit (see the review elsewhere in this issue).

Lee Calcraft



ROBICO ADVENTURES

FOR THE ARCHIMEDES

RISE IN CRIME (*Archimedes 305/310/400 £29.95*)

In the vast, galaxy-wide federation, you are one of the abnormal, few, unconditioned, discontented and insubordinate! Can you rid yourself of the shackles of this conformist, mind-imprisoned society? Rise in Crime boasts over 396K of text, 400 individually described locations, 150 objects and several *high resolution colour graphic screens*! Mouse driven input and an advanced parser make this a superb addition to your Archimedes collection!

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As Paul Preston, respectable schoolmaster, your life is shattered when you are convicted of murder – a crime you did not commit! Set in 1952, against the stunning backdrop of southwest England, the hangman's noose awaits unless you escape and find the evidence to clear your name! Fugitive's Quest is a large adventure with about 230 locations, 80 objects and reams of well written text. An advanced parser, mouse driven input and several *full colour, photo-quality illustrations* complete the unmistakable feel of Robico quality.

ENTHAR SEVEN (*Archimedes 305/310/400 £29.95*)

It is the distant future... Whilst on board a tiny Interplanetary Space Hopper its orbit begins to decay: Once on the planet surface can you escape and return, again, to the freedom of the stars? *Enthar Seven* is a disk based mega-adventure! It has 450 locations, 80 objects, a massive vocabulary and 1200 messages! And that's just the 8-bit versions! The Archimedes version has over 140K of text and some of the *best graphics you'll ever see!*

You can order by telephone using your ACCESS card, or by cutting out the coupon below. All orders are despatched first class by return.

TO: ROBICO, 3 FAIRLAND CLOSE, LLANTRISANT, MID GLAMORGAN CF7 8QH

Tel: (0443) 227354

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FUGITIVE'S QUEST	ARC		£29.95	
ENTHAR SEVEN	ARC		£29.95	

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Postbag

A TOUCH OF ALCHEMY

I would like to point out an inaccuracy in Volume 2 Issue 7. You say that the 'Archimedes Visuals' is a carbon atom animation. You also state, correctly, that the animation shows 12 electrons moving round its nucleus. However, a carbon atom only has 6 electrons. Carbon has a total of 12 nucleons (6 neutrons and 6 protons). As it has 6 protons and is not ionised (as it is an atom) it follows that it must also have 6 electrons. The element with 12 electrons, which the animation actually shows, is magnesium.

David Miller

Mr Miller was not the only RISC User member whose sharp eyes spotted this. Clearly our knowledge of chemistry (or is it physics) is not to the same standard as our computing. Our apologies for any confusion which this mis-labelling caused.

A3000 A BUSINESS MACHINE?

As a non-educational user, I am surprised and disappointed that in your June review (Volume 2 Issue 7) you dismiss the A3000 as not being a business machine. Surely, if a hard disc (or even a second floppy) can easily be added, why should it not be a full-blown business machine? Software firms considering supporting the A3000 for business applications will surely be put off by such attitudes.

The line between home, business and even education uses for micros is narrowing fast. Retaining these artificial divisions is now becoming outdated and inappropriate.

S.Morris

I do not believe we 'dismissed the A3000 as not a business machine' but stated what I believe to be true, namely that Acorn was targetting the A3000 towards the lower end of the educational market and to the home user, in competition with the Atari ST for example. That does not make it any the less of a business machine, but we would still recommend business users to go for a 400/1 series machine, where a hard disc or second floppy can be mounted internally, and any machine in the range can be enhanced to 4MBytes of memory.

COPY PROTECTION

I agree entirely with Simon Coulthurst (Postbag, RISC User Volume 2 Issue 7) regarding the form of copy protection used by Minerva. I use System Delta Plus, and have corresponded with Minerva about their policy on this, receiving the same unsatisfactory answer.

Many people must be deterred from buying, or making full use of System Delta Plus because of the way copy protection is applied. First of all, the resultant disc swapping is very annoying, but more important are the issues concerned with long term security and the accessibility of one's data; what happens, for example, if Minerva should unfortunately cease to trade? And it goes against the grain to fork out another £25 for a spare disc, or £199 for a copyable version when one simply wishes to continue as a single user.

One asks oneself what the value of a relatively weak method of copy protection can be. The accomplished 'hackers' will have little difficulty in making copies. Hence the protection only prevents small-scale trading in copies, by those with less skill; the cost to Minerva in annoying the user, and in lost sales, must surely outweigh this?

David Casey

Copy protection is a subject that seems to arouse strong feelings in a number of users, and in some software houses as well. Clearly users, particularly those who make frequent use of some application and maybe depend upon it in some way, feel more vulnerable to possible corruption of software, and a greater need to have a full backup facility. Software houses are equally concerned about software piracy. The world of microcomputers as a whole seems to be heading towards non-protected but maybe personalised software, which may in turn reflect a greater maturity by the computing community as a whole. If anyone (user or supplier) would like to argue for some form of copy protection then we would be pleased to consider their views for publication on this page.

HOLED OUT !!

3D

GOLF GAME

EXTRA COURSES

ARE NOW AVAILABLE



ARCHIE POWER

Holed Out really shows off the power of the Archimedes at its best. The game is completely mouse controlled and features atmospheric digitised sound effects to convince you that you are really playing golf.

Each of the 3 versions of Holed Out include an Instruction Manual which features easy to follow guidelines, general rules of golf and detailed scale maps of all their respective 36 holes.

The extra courses are generally harder: narrower and smaller fairways, very "protective" bunkers, stronger winds, steeper slopes etc. etc.

"I play golf and this is the nearest thing I've seen to the real game on a computer".

Archive June 1989

2 NEW VOLUMES

In response to your many requests we have now produced 2 volumes of extra courses. Each volume contains 2 superbly designed brand new courses plus the original Holed Out main program; therefore you do not need the original Holed Out to play them. Each course has been meticulously created to test your golfing abilities to the limits. The holes are very varied and even Nick Faldo would need to use all his skills to keep up his recent record.

Holed Out Extra Courses Volume 1
Holed Out Extra Courses Volume 2

REVIEWS

"In the June issue of the Micro User, Holed Out for the BBC Micro was described as a test of skill not to be missed. The same game has now been released for the Archimedes and it is quite a stunning piece of work, ranking with Zarch and Conqueror in quality.....The graphics are effective and have amusing little touches like the ripples when the ball hits the water and sand flying into the air when you are trying to get out of a bunker.....a great game." THE MICRO USER August '89.

"Sound is definitely a feature of Holed Out. There are samples for all sorts of situations: hitting trees, splashing into water, dropping into the hole and of course whacking the ball." ACORN USER August '89.

HOW TO GET HOLED OUT

Archimedes 3 1/2" Discs :-

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DESKTOP HINTS

Rounded up by Lee Calcraft

CONFIGURING THE DESKTOP

To make your machine start up in the Desktop, type:

*Configure Language 3

and press Ctrl-Break. To make it start up in Basic, type:

*Configure Language 4

and press Ctrl-Break.

DESKTOP KEYS

The following summary of the effects of various keys and mouse buttons may prove useful

Function Key 12

F12	Star command
Ctrl-Shift-F12	Quit the Desktop

The Shift Key

Holding down the Shift key has the following effects:

1. Double-clicking on an application will *open* the application directory rather than running it.
2. Dragging a file or directory to copy it to another directory alters the operation to a *move*, with deletion of the source(s).

The Adjust Button

Using the Adjust button rather than Select has the following effects:

1. Scroll in the opposite direction on scroll bars etc.
2. Single-clicking will mark an object without un-marking previously marked objects.
3. Double-clicking on a directory opens or runs it as normal, but it also *closes* the parent directory.
4. Clicking on a Filer Quit icon closes the directory but also *opens* the parent.
5. Dragging a file or directory to copy it to another directory causes the source directory to be closed after the copy has been carried out.

DRAGGING OBJECTS

To simultaneously drag a number of objects for copying or whatever, mark each in turn using the Adjust button, then drag with Select (or with Adjust if you want to close the source directory).

When dragging objects to an icon or directory, the tip of the pointer determines the destination of the drag, regardless of the size or position of the accompanying drag box.

COPY WARNING

When copying objects by dragging them from one directory to another on the Desktop, the setting of the variable Copy\$Options will determine how the copy takes place. By default it is not set up for forced overwriting of objects. Consequently, if there is already an object in the destination directory with the same name as that to be copied, the copy will not take place. When this occurs, no message is given, and the result can be that you fail to back-up a particular file. It is very easy to fall into this trap if you are copying a number of files at once, or if you have a hard drive. In either case, whether a particular file has copied over would not be obvious.

To rectify the problem, use:

*SHOW Copy\$Options

If a "~" character appears immediately before the "F" in the display, then forced overwriting is *not* set. To rectify this, use for example:

*Set Copy\$Options ~C ~D F ~P ~Q R V

using the response to *Show as a guide to the state of the other options. See the RISC OS User Guide for further details.

AUTOMATIC START-UP

To enter the Desktop and automatically run or install an application, type:

*Desktop <name>

where <name> is the name of the application, as referenced from a named disc. For example:

*Desktop ADFS::RU207v1_00.\$.!NotePad

will enter the Desktop and place the RISC User NotePad icon on the icon bar, ready for immediate use - always assuming that RISC User magazine disc Volume 2 Issue 7 (with disc name "RU207v1_00") is in your disc drive at the time.

To go one step further, and run !NotePad with the NotePad file *Notes* loaded, use:

*Desktop ADFS::RU207v1_00.\$.!NotePad Notes

Unfortunately you cannot use these tricks with applications such as ArcDraw which need resources from the !System directory, since the Filer will not have seen the resource directory before an attempt is made to run the application. In such cases you will need to adopt the technique described in RISC User Volume 2 Issue 7 page 33.

RU

HINTS & TIPS

HINTS & TIPS

David Spencer rounds up another collection of hints and tips.

BASIC TEXT SAVE (for non-Twin users)

The operating system alias given below allows a text version of a Basic program to be saved directly, simply by typing TWIN. This works because when you execute TWIN (or TWINO) from Basic, the current program is detokenised, and the command *TWIN executed with parameters indicating where the text version of the program is stored. The alias picks up the TWIN command, strips out the addresses and saves the text file with the name 'TextProg'. The *BASIC is necessary because Basic doesn't expect the *TWIN command to return. Incidentally, don't add any spaces to the alias when entering it, as it will then be too long when the operating system expands it.

```
*Set Alias$Twin SetEval x1 ("%*0"RIGHT(LEN
"%*0"-1))LEFT8|MSetEval x2 "%*0"RIGHT(LEN"
"%*0"-10))LEFT8|MSet Alias$x Save TextProg
|<x1> |<x2>|MSetType TextProg Text||MBasi
c @|<x1>,|<x2>|Mx
```

To revert the TWIN command to its real function, use:

```
*UNSET Alias$Twin
```

To load a text file back into Basic, the corresponding command to use is:

```
*BASIC -load <filename>
```

Thanks to Roger Wilson of Acorn for this idea.

PRINTER PROBLEM

When using certain early Archimedes with particular printers, occasional characters can be lost. This is particularly apparent when performing screen dumps on an Integrex 132 colour printer, causing blank lines to appear. This symptom is caused by a minor hardware problem with the computer, and it can be corrected by taking the machine to an Acorn dealer and asking them to perform Acorn field change order 2002, which they should do free of charge.

GET THE LINGO RIGHT

Do you know how to pronounce RISC OS? According to Acorn it should be *Risk Oh Ess*, and not anything else you might think of. And while they are about it, gone are graphics and text windows. Instead, these are now called

Viewports - presumably to avoid confusion with WIMP windows. And just to round things off, the beloved Podule has been wiped off the surface of the earth. From now on, things that plug into the backplane are to be referred to as plain boring *expansion cards*. Is the name Archimedes safe we ask?

DEFECTIVE DISCS

With the new E format discs offered by RISC OS, it is no longer necessary in most cases to throw away, or even reformat, a disc which develops a defective sector. Instead, the defect can be mapped out by using the command *DEFECT. This takes two parameters, the first being the drive number or name, and the second the disc address of the defect in hex. For example:

```
*DEFECT :0 24800
```

The easiest way to find out this address is to use *VERIFY which will report the disc address of each defect.

If the specified defect is on an unused portion of the disc, then it will be mapped out. On the other hand, if the defect lies within a file, then the name of that file is printed. It is then up to you to delete the file if you wish, and issue the *DEFECT command again. If the defect lies in the disc allocation map, then you will get the message 'Can't map out defect', and the disc will have to be reformatted.

PSEUDO FILING SYSTEMS

Under RISC OS (and indeed Arthur), it is possible to direct any star command to a particular module. The two main uses of this are for executing a command on one filing system while another is selected, and for resolving problems when two modules use the same command name (for example *MEMORY is in both the debugger and Clares Toolkit Plus). To do this, prefix the command with the module name thus:

```
*Adfs:Info * or
*Debugger:Memory 10000
```

SILENT NETWORK

By default, RISC OS pops up the hourglass when performing lengthy operations on an Econet Network. If for any reason you want to stop this, simply execute:

```
*RMKILL NetStatus
```

RU

RISC User Magazine Disc

September 1989

ARM CODE SINGLE STEPPER A module which allows any ARM machine code program to be executed one instruction at a time. The register and memory contents can be read and altered between each instruction. The disc contains the fully commented source code for the module.

RISC USER DESKTOP DIARY

The first half of this handy RISC OS Desktop application.

A POP-UP FILE SELECTOR (disc only)

A user-friendly procedure which allows you to step through directories and choose files using the mouse. This routine can easily be incorporated into your own programs.

ARCHIMEDES VISUALS: INBETWEENING

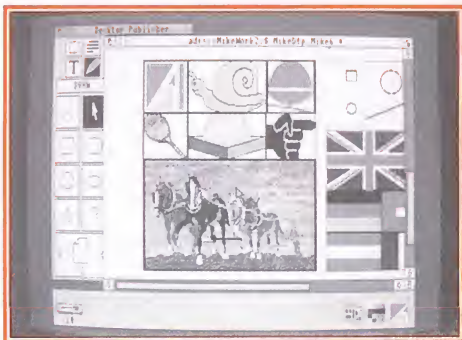
A simple, yet flexible, program to illustrate how the Archimedes can be put to good use in animation.

MASTERING THE WIMP

This program from the first part of our major new tutorial series shows how to get a Wimp based multi-tasking program up and running.

TRANSFERRING DATA FILES BETWEEN SOFTWARE PACKAGES

A program to convert files created using BEEBUG's Masterfile to Logistix format.



STICKY DESKTOP

A handy RISC OS Desktop utility which allows files and directories to be dragged out of Directory Viewers, and stuck to the Desktop for use at any time.

* BONUS ITEMS *

DIGITISED SCREEN A sample of the results that can be produced using the digitiser feature of the Brainsoft multi-IO module.

ATELIER SCREENS Some sample screens produced using Atelier from Minerva, reviewed in this issue.

ACORN DTP SCREENS Some examples of Acorn's new DTP package in use.

ARCSCAN DATA Index entries for this issue of RISC User and the latest BEEBUG (Vol.8 No.3) to be used with Arcscan.

RISC User magazine discs are available to order, or by subscription. Full details of prices etc. are given on the back cover of each issue of RISC User.

ARCHIMEDES SOFTWARE

- Disc 1 EMACS. Super editor with language. Now includes full C source code.
- Disc 2 MicroSpell. 43,000 word real time spelling checker module.
- Disc 4 XLISP. Object oriented version of LISP with C source and programs.
- Disc 5 C Toolkit. 20+ progs for C programmers. With C sources. grep, awk,...
- Disc 6 Kermit. Archimedes, BBC and MSDOS versions of file transfer prog.
- Disc 7 WIMP Chess. Good Wimp based chess game with many features.
- Disc 8 CrossStar. Wimp based crossword solver with huge dictionary.
- Disc 10 More C Tools. yacc and lex with examples and C source. diff, ctags.
- Disc 11 Little SmallTalk. Original object oriented language with C source etc.
- Disc 14 GNU Tools#1. High quality tools with C source. egrep, sed, awk and diff.
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